Rhodora

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EDITORIAL ANNOUNCEMENT.

THIS JOURNAL is founded by the NEW ENGLAND BOTANICAL CLUB, with confidence that it will give new stimulus and render material aid to the study of our local flora. Its publication has not been undertaken without mature consideration, nor until, through the keen and helpful interest of New England botanists, a sufficient subscription list has been secured to assure its monetary support. In the selection of subject-matter, special attention will be given to such plants as are newly recognized or imperfectly known within our limits, to the more precise determination of plant ranges, to brief revisions of groups in which specific and varietal limits require further definition, to corrections upon current manuals and local floras, to altitudinal distribution, plant associations, and ecological problems. For the present, at least, little of our limited space can be devoted to histology or technical physiology. Not only the flowering plants, but the ferns, mosses, and thallophytes will receive their proportionate share of attention, and it is hoped that frequent articles upon the fleshy fungi may respond to an increasing popular interest in this group.

Contributions will be welcomed from anyone interested in the scientific study of the New England flora. A decided preference will be given to articles which embody some newly observed fact, tersely stated. We feel, however, that the power of making such contributions lies within the reach of almost every careful amateur as well as professional botanist. It is unusual to spend a vacation in collecting and identifying plants without finding some which extend known ranges, grow in unusual habitats or at unrecorded altitudes, exhibit exceptional morphological features, or in some other way transgress those laws which scientists have considerately imposed upon them. Such observations, while seldom startling, are usually of scientific value, and surely worthy more permanent record than the customary pencil note upon the margin of some well-thumbed manual.

In such matters as nomenclature, punctuation, capitalization of scientific names, modes of bibliographical citation, etc., contributors will have full power to follow personal preferences, provided their usage is consistent with itself. The editors reserve, however, the right of adding parenthetical synonyms, if such are deemed necessary for ready intelligibility.

The name Rhodora, although the designation of one of our most attractive New England plants, has been chosen, not from sentiment but primarily from a desire to have a distinctive and euphonious one-word title, experience having amply shown that similar titles (e. g. Linnæa, Grevillea, Helios, Erythea, Auk, Ibis, etc.) soon become familiar, and possess great merit in their brevity and ease of citation.

THE RATTLESNAKE-PLANTAINS OF NEW ENGLAND.

M. L. Fernald.

(Plate 1.)

For several years a Rattlesnake-Plantain, common in the White Mountains and other sections of New England, has passed as *Goodyera Menziesii*, a species previously considered typical of the Rocky Mountains and the northwestern Pacific slope, also by exception found on Lake Superior and in Lower Canada. This White Mountain plant was collected at Crawford's by Miss Minns, whose specimens were referred by Dr. Watson, in the sixth edition of Gray's Manual, to that northwestern species. Recently the plant of the White Mountains has been collected in various other parts of New England, even as far south as Connecticut, where it has passed for *Goodyera repens*. The Messrs. Faxon, and others active in the botanical exploration of the White Mountains, have pointed out, however, that this New England plant is really very different from the *Goodyera Menziesii* received from northwestern collectors. Much material has been accumulated, and a critical study has been made, with the hope of determining, if possible, the identity of this doubtful plant.

True *Goodyera Menziesii* is a well-understood species, northwestern specimens having been kindly examined by Mr. Edmund G. Baker, of the British Museum, and pronounced identical with the original plant of Menzies. This species is the largest of our American Goodyeras,

and it differs from the other northern species, *G. pubescens* and *G. repens,* in its scarcely saccate involute lip, in the elongated beak of the stigma, and in the long-pointed anther. The rather densely flowered spikes are usually secund, placing the plant, habitally, near the smaller *G. repens* with its deeply saccate lip revolute on the margin, its short stigmatic beak, and blunt anther. The northeastern plant which has often passed as *G. Menziesii* and sometimes as *G. repens* is intermediate in size between them, but it has the flowers in a loose spiral. The lip, though less saccate than that of *G. repens,* has a flaring margin, as in that species; while the long stigmatic beak and acuminate anther suggest an equally close relationship to *G. Menziesii.*

As stated, *Goodyera Menziesii* is a comparatively large plant, averaging 3.5 dm. high, sometimes becoming as tall as 4.5 dm.; and frequently producing stout stolons at the base. The firm leaves, either plain dark green or indistinctly white-reticulated, and often having broad irregular white midribs, vary from .5 to 1 dm. in length. During anthesis the spike is generally about 1 dm. long, though some luxuriant specimens have spikes 1.5 dm. in length; and the perianth is 8 or 9 mm. long. The common New England plant, which has passed as *G. Menziesii,* is much smaller in all its parts than that species. The scapes are usually about 2 dm. high, though they are sometimes found more than 3 dm. in height; and the plants are not conspicuously stoloniferous. The dull green less firm leaves, irregularly mottled with paler green or rarely with white, average 4 cm. in length. The loosely spiral spike, during anthesis, is about 6 cm. in length, but exceptional specimens have spikes fully 1 dm. long. The perianth is about 5 mm. long. No reference to this smaller plant has been found in recent literature, except as *G. Menziesii* or *G. repens;* but in 1824, in his "Botanical Cabinet," Loddiges published, from "the colder parts of North America," *G. tesselata,*[1] which, from his colored figure, appears the same as this. It has been impossible to learn of authentic specimens bearing Loddiges' name, and Mr. Baker writes that there is little chance that such material now exists. Notwithstanding this unfortunate lack of type specimens, little hesitation is felt in referring this New England plant to Loddiges' species, since both the leaves and spike, as drawn, well represent our plant. A year later, in 1825, the same plant was described and figured by Sims[2] as *G. pubescens,* var. *minor,* distinguished from the species by its smaller size and obscurely marked leaves.

[1] Lodd. Bot. Cab. x. No. 952. [2] Bot. Mag. lii. t. 2540.

In examination of the literature and figures bearing upon this question it has become apparent that the little plant of northern New England, familiar to American botanists as *Goodyera repens,* is, in a striking superficial character, unlike the true *G. repens* as represented by authentic European figures and specimens. The plant of northeastern America known as *G. repens* is much smaller than the other northern species, and its dark green leaves have darker sub-horizontal veins usually bordered by conspicuous white markings. On the other hand, the common *G. repens* of Europe and Asia, as represented not only in descriptions and specimens, but also by colored plates, has slightly larger leaves, often with dark veins, but rarely, if ever, with the conspicuous white markings shown in the American plant. In inflorescence and in flower-structure, however, the European and American plants are not distinguishable. The form of *G. repens* which grows in northeastern America is not entirely unknown, however, in Europe: a number of authors, from Mentzel to Reichenbach, have mentioned it, although it is apparently rare. Nor is the European form of *G. repens* altogether wanting in America. Specimens from the northern Rocky Mountains, collected by Bourgeau on the Palliser expedition, have the same green leaves without white markings, as do also later specimens found on Pike's Peak by Aubrey H. Smith; and, in his Flora Boreali-Americana, Hooker cites specimens from the Rocky Mountains (*Drummond*) and from the Saskatchewan to Fort Franklin (*Dr. Richardson*) having leaves "rarely reticulated with white veins." Though the northeastern plant appears superficially different from the typical *G. repens,* it seems wisest, in view of the identical flower-structure, and the occasional presence in America of the typical form and in Europe of the other, to regard this plant with white-reticulated leaves as no more than a variety of *G. repens.*

In the following synopsis an attempt is made to state the more readily recognizable characters of these different forms; and to show, in some detail, the range, as accurately as is yet known, of each species in New England, and in a general way its broader range in America. In determining the ranges of these plants in New England, not only the material in the Gray Herbarium and the Herbarium of the New England Botanical Club has been consulted; but much help has been gained by the use of specimens kindly placed at my disposal by Judge J. R. Churchill, Professor L. R. Jones, Dr. C. W. Swan, and Messrs. H. S. Clark, Walter Deane, Chas. E. Faxon, C. W. Jenks, E. L. Rand, and

E. F. Williams. To all these gentlemen grateful thanks are extended for the assistance rendered; and to Mr. Faxon I am especially indebted for the careful drawings he has so kindly made to illustrate the floral details of the species here discussed.

Synopsis of New England Species.

* Flowers in a dense spike: lip strongly saccate, with a short, blunt tip, the margin not recurved or flaring.

G. PUBESCENS, R. Br. Stem rather stout, 1.5 to 4 (generally about 3) dm. high, occasionally stoloniferous: leaves dark green, ovate to oblong, about 5 cm. long (3 to 6.5 cm.), with 5 or 7 white nerves (the middle one broad), and many fine white reticulating veins: spike, during anthesis, about 7 cm. long (3 to 11 cm.): perianth[1] about 4.75 mm. long (4 to 5.5 mm.); lip globose-ventricose: anther blunt: stigma with two very short teeth. — R. Br. in Ait. Hort. Kew. ed. 2, v. 198; Lodd. Bot. Cab. i. no. 1: Lindl. Collect. t. 25 and Gen. et Sp. Orch. 492; Sweet, Fl. Gard. ser. 2, t. 47; Fl. de serres, xv. t. 1555. *Satyrium repens*, Michx. Fl. Bor. Am. ii. 157, in part, not L. *Neottia pubescens*, Willd. Sp. iv. 76; Pursh, Fl. ii. 590. *Tussaca reticulata*, Rafin. Préc. Déc. 43. *Orchiodes pubescens*, O. K. Rev. Gen. ii. 675. *Peramium pubescens*, MacMillan, Met. Minn. 171. — Common, generally in dry woods, throughout southern New England, extending north to Milton, Vermont (*L. R. Jones*), Jaffrey, New Hampshire (*Walter Deane*), Orono, Maine (*M. L. Fernald*), and Mount Desert Island (*E. L. Rand*); westward to Minnesota and southward to Florida. Said to grow also in Newfoundland and Canada. Flowering in late August and early September.

** Spike loosely flowered: saccate lip with an elongated tip and flaring or recurved margin.

+ Flowers in a 1-sided spike: anther short, blunt, or with a short blunt tip[2]: beak shorter than the body of the stigma.

G. REPENS, R. Br. Stem slender, 1 to 2.5 (generally about 1.5) dm. high, often producing slender stolons: leaves ovate to oblong-lanceolate, 1 to 3 cm. long, 5-nerved, with sub-horizontal dark veins: spike, during anthesis, about 4.5 cm. long (2.5 to 6 cm.): perianth 4 mm. long; lip strongly saccate-inflated, with a recurved tip. — R. Br. in Ait. Hort. Kew. ed. 2, v. 198; Hook. Fl. Bor.-Am. ii. 203; Lodd. Bot. Cab. xx. no. 1987; Lindl. Gen. et Sp. Orch. 492; Reich. Fl. Germ. xiii. 155, t. 482, f. i, ii; Thomé, Fl. Deutsch. i. t. 157 B. *Satyrium repens*, L. Sp. 945; Jacq. Aust. iv. t. 369; Fl. Dan. v. t. 812; Engl. Bot. v. t. 289. *Epipactis repens*, Crantz, Stirp. Aust. ed. 2, 473. *Serapias*

[1] All measurements are from herbarium specimens.

[2] The form of the filament, hitherto somewhat relied upon for distinctions, seems an unsatisfactory specific character.

repens, Vill. Dauph. ii. 53. *Neottia repens*, Swartz in Vet. Akad. Handl. Stockh. xxi. (1800) 226; Willd. Sp. iv. 75. *Orchis repens*, Eyst. Hort. ex Poir. Encyc. vi. 581. *Peramium repens*, Salisb. Trans. Hort. Soc. i. 301; MacMillan, Met. Minn. 172. *Tussaca secunda*, Rafin. Préc. Déc. (1814) 43, and in Desv. Jour. Bot. iv (1814) 272. *Orchiodes repens*, O. K. Rev. Gen. ii. 674. — In boreal and arctic Europe and Asia. In America, definitely known only from the extreme north and from the Rocky Mountain region: Cumberland House, 1825 (*Drummond*); "Mountain woods of the Rocky Mountains (*Drummond*) and from the Saskatchewan to Fort Franklin, *Dr. Richardson*" — according to Hooker; Rocky Mountains, 1858 (*Bourgeau*); in woods, lower slopes of Pike's Peak, Colorado, 1878 (*Aubrey H. Smith*). Probably more generally distributed in America than at present known; but certainly not so common in the east as the following: —

Var. **ophioides.** Generally a little lower than the species: leaves rather smaller, the veins bordered by conspicuous broad white pencilings, strongly suggesting the markings of a serpent. — *G. repens* mostly of American authors; Reich. Fl. Germ. xiii. 155, in part, t. 482, f. iii. *Pseudoorchis rad. repente fol. maculatis duplex*, Mentz. Pug. t. 3, f. 4, 5. *Satyrium repens* β, L. Sp. 945. *S. repens*, Schkuhr, Handb. t. 272; Michx. Fl. Bor. Am. ii. 157, in part. *Neottia repens* β, Willd. Sp. iv. 76. — Less common in Europe than the species. In America mostly confined to the northeastern States and Canada; growing in cold, mossy woods, and, in northern New England, flowering in the latter half of July. The following specimens have been examined: Newfoundland: Bay of Islands, Aug. 25, 1896 (*A. C. Waghorne*). Quebec: Falls of the Chaudiere, Aug., 1825 (*Mrs. Shepard*). Manitoba: Blood Vein, Lake Winnipeg (*J. M. Macoun*). Maine: Allaguash, Fort Kent, Orono, Mt. Bigelow, alt. 925 m. (*M. L. Fernald*); Somerset Co. (*C. F. Batchelder*); Mount Desert Island (*E. L. Rand, Miss E. L. Shaw*). New Hampshire: Frequent in the White Mountains (*J. Bigelow* et al.). Vermont: Willoughby Mt. (*E. F. Williams*); Monkton (*C. G. Pringle*). Massachusetts: Southwick (*E. Gillett*). New York: in the lake region of western N. Y. (*Asa Gray*). Michigan: Keweenaw Co. (*O. A. Farwell*). North Carolina: Great Smoky Mts., alt. 1230 m. (*Beardslee & Kofoid*).

+ + Flowers mostly in a loose spiral: anther acuminate: beak as long as, or longer than, the body of the stigma.

G. tesselata, Lodd. Stem stouter than in *G. repens*, averaging 2 dm. high (rarely 3.5 dm.), sometimes stoloniferous: leaves about 4 cm. long (2 to 7 cm.), ovate to oblong-lanceolate, 5 to 9-nerved, with subhorizontal or oblique slightly interlacing veins; the veins bordered by irregular generally pale-green pencilings, the whole blade often irregularly mottled with dark and light green, or rarely without markings: spike, during anthesis, about 6 cm. long (rarely 1 dm.): perianth 5 mm. long; the lip less saccate, and with the tip less recurved than in *G. repens*. —

Bot. Cab. x. no. 952. *G. pubescens*, R. Br., var. *minor*, Sims, Bot. Mag. lii. t. 2540. *G. Menziesii*, Wats. & Coult. in Gray, Man. ed. 6, 504, in part (as to Tadousac, Crawford, and New York plants), not Lindl. *Peramium Menziesii*, Morong in Britt. and Brown, Ill. Fl. i. 475, in part, not Morong Mem. Torr. Cl. v. 124. — In upland woods, rarely in bogs or deep moss, Salmonier River and Whitbourne, Newfoundland (*Robinson & Schrenk*) and Tadousac, Quebec (*G. L. Goodale*) to Lake Nipissing, Ontario (*G. S. Miller, jr.*), south to Hartford, Connecticut (*H. S. Clark*), Catskill Mts., New York (*Geo. Thurber*) and Seneca Co., New York (*Asa Gray*). The commonest species in northern New England, flowering in August.

*** Spike 1-sided rather densely flowered: lip scarcely saccate, elongated, with the margin involute.

G. Menziesii, Lindl. Stem rather stout, 3.5 dm. high (sometimes 4.5 dm.), often producing stout stolons: leaves firm, .5 to 1 dm. long, plain green, often with broad, white midribs, or rarely mottled with dark and light green: spike, during anthesis, about 1 dm. long (occasionally 1.5 dm.): perianth 8 or 9 mm. long: anther ovate, long-acuminate: slender beak longer than the body of the stigma. — Gen. et Sp. Orch. 492; Brew. & Wats. Bot. Cal. ii. 136; Wats. & Coult. in Gray, Man. ed. 6, 504, in part. *Spiranthes decipiens*, Hook. Fl. Bor.-Am. ii. 203, t. 204. *Orchiodes Menziesii*, O. K. Rev. Gen. ii. 675. *Peramium Menzïesii*, Morong, Mem. Torr. Cl. v. 124, and in Britt. & Brown, Ill. Fl. i. 475, in part. — In dry woods, flowering in August, Mt. Albert, Gaspé Co., Quebec (*J. A. Allen*); Squaw Cap Mt., Restigouche, New Brunswick (*G. U. Hay*); Frenchville, Aroostook Co., Maine (*Kate Furbish*); Allaguash, Aroostook Co., Maine (*M. L. Fernald*); on the Great Lakes, from Lake Huron westward (*Goldie, Robbins*, et al.); Rocky Mountains, from British Columbia to Arizona; also California and northward.

Explanation of Plate 1. — *Goodyera Menziesii*: fig. 1, flower; fig. 2, lip; fig. 3, column from side; fig. 4, column from front; fig. 5, column from back. *G. tesselata*: fig. 6, flower; fig. 7, lip; fig. 8, column from front; fig. 9, column from side. *G. repens*: fig. 10, flower; fig. 11, lip; fig. 12, stigma from front; fig. 13, column from back; fig. 14, column from side.

THE SANICULAS OF WESTERN VERMONT.

Ezra Brainerd.

The four species of Sanicula, as set forth by Mr. Bicknell in the Bulletin of the Torrey Bot. Club for August, 1895, occur not infrequently in western Vermont. A few notes are herewith presented, the result of frequent observation of the growing plants during the past summer.

The four forms are well marked, and are undoubtedly good species. Indeed, it is surprising that a plant so distinct in appearance as *S. gregaria,* both in the flowering and fruiting stages, and so widely distributed, as it seems to be in the east, should have so long failed of recognition as a species. A peculiarity of this species, not before reported, is that some of the plants bear small black tubers attached to the main root or to its fibres an inch or two from the base. This may have something to do with the gregarious habit of the species. The two species most likely to be confused, especially at the period of flowering, are *S. Canadensis* and *S. trifoliata*. The number of the leaflets is not a safe guide ; for the upper leaves of *S. Canadensis* are trifoliolate, and the lower leaves of *S. trifoliata* have the outer segments parted as in *S. Canadensis*. However, the leaflets of *S. trifoliata* are broader and more coarsely serrate, the branches more remote on the stem, the stem more flexuous, the fruit-bearing rays longer, the time of flowering a week earlier, and (best test of all) the pedicels of the staminate flowers are fully twice as long. In luxuriant plants of *S. trifoliata* there is not only a branch from the axil of every stem-leaf, but one or more from the base of the stem, so that the plant is broad and bushy. When in fruit, the two species may be distinguished at a glance.

It should be noted that these two species have not only short styles, but also correspondingly short stamens — hardly at all exserted — and short petals, about half the length of the calyx-lobes. The flowers are thus inconspicuous. The long-styled species, on the contrary, with their numerous staminate flowers, long filaments, and bright colored anthers, produce a marked floral effect.

Each species continues in flower for a week or ten days. The dates at which flowering commenced the past summer were as follows : —

Sanicula	*Marylandica*, L.,	June	1
"	*gregaria*, Bicknell,	"	1
"	*trifoliata*, Bicknell,	"	20
"	*Canadensis*, L.,	"	27

The fruit of the long-styled species was mature by the middle of August. That of *S. Canadensis* ripened a week or two later ; while the carpels of *S. trifoliata* were green until September.

By far the most common species in western Vermont is *S. Marylandica*. It is the species of widest geographical range ; I collected it in August, 1897, along the Columbia River at Revelstoke, B. C. It ascends, also, to a higher altitude than any of the other eastern spe-

cies. I find it as high as 1,500 ft. in the Green Mountains; the others never above 500 ft. In the mountains it grows in boggy thickets; but at lower levels in dry or moist, but not wet, woodlands.

The other species are far more exacting in their requirements as to soil, moisture and shade. *S. gregaria* grows in quite moist, heavy soil, rich with leaf-mould, where one would look for *Phegopteris hexagonoptera* or *Asplenium angustifolium*. It affects the banks of small brooks in flat woodlands. *S. trifoliata* also requires moisture, and is often found growing with *S. gregaria*; but it also occurs on banks of gravel or till, along the base of the mountains. *S. Canadensis* is found along shaded ledges in a drier situation than that required by the other species; but in two localities I have seen it growing with *S. trifoliata*. The fruiting characters of the four species are fully and admirably described by Mr. Bicknell in the article above cited.

Middlebury College.

NOTES ON ALGAE. — I.

F. S. Collins.

In this series of articles the writer hopes to publish, from time to time, such additions to the New England Algae as may come to his notice, as well as items of interest in regard to species already known to exist here. The present paper adds two species new to America; the type of one species hitherto represented only by a variety; and one species believed to be undescribed.

The first addition to the American flora, *Cylindrospermum catenatum* Ralfs, is distinguished from other species of the genus by having the spores in series, sometimes as many as fifteen adjoining; while all others have the spores scattered singly through the filament. It occurred on moist ground in Middlesex Fells, Mass., by the shores of Spot Pond, in August and September, 1898, the spores reaching maturity the last of September. It formed a dark, thin coating on the ground, looking as if a little black paint had been spilled and dried.

The past summer was a very favorable one in this vicinity for algae of this kind; the weather was extremely hot in July and August all over the country; but while there was almost a drought in many sections, as in New York State and in Maine, on opposite sides of this region, in the vicinity of Boston there were frequent rains, so that even

in the last of August the foliage had hardly lost its spring freshness, and the brooks flowed as freely as in April or May. The algae that usually show themselves as the water in the ponds becomes low had no chance to make an appearance; while those that grow on damp ground were more abundant than in any previous season that the writer can remember. *Schizothrix Friesii* (Ag.) Gomont was specially abundant in paths and by roadsides in Middlesex Fells and Lynn Woods; like some of the higher plants, it seems to prefer roads and paths to woods and fields. Other species of *Nostochaceae*, though not so conspicuous as the Schizothrix, were much more noticeable than usual.

A second species of Schizothrix, *S. purpurascens* var. *cruenta* (Lespinasse) Gomont was found on the ground near Winchester Reservoir in Middlesex Fells, Mass., in August and September. It grew in company with Stigonema species, etc., and has not before been reported in N. America. There is, however, a specimen in Herb. Farlow, collected by Ravenel in South Carolina. It is characterized chiefly by the ample, red or rose-colored sheaths, trichomes 6-8 μ diam., and by the prostrate habit.

In August, 1896, the writer described in Erythea, Vol. IV, p. 119, and in September of the same year distributed in Collins, Holden and Setchell, Phycotheca Boreali-Americana, No. 207; *Anabaena catenula* var. *Americana* Collins. It grew in a ditch in Middlesex Fells, among other species of minute algae; and differed from the European type in having longer spores, up to 60 μ, the spores being exactly cylindrical. In the same summer, the writer found what appears to be the typical *A. catenula* (Kuetz.) Born. & Flah., with spores not over 30 μ long, and slightly constricted at the middle. It occurred at Eagle Island, Penobscot Bay, Maine; growing in a ditch near the beach, above high water mark, but probably within reach of the spray in storms. The algae growing with it were, however, all strictly fresh water species.

In July, 1890, the writer found a small Rivularia growing on submerged stones on the borders of Spot Pond, in what is now the Middlesex Fells Reservation. It was placed in his herbarium under *R. minutula* (Kuetz.) Born. & Flah., but with a mark of doubt. Since then, a specimen has been submitted to Dr. Bornet, who has pronounced it distinct from the species named, and probably from any described species. The writer would characterize it as follows: —

Rivularia compacta, n. sp. Fronds globose or subglobose, firm, not encrusted with lime, dark green or blackish, smooth, minute, sel-

dom over 2 mm. diameter. Filaments closely packed, sheaths 15-20 μ diameter, colorless or yellowish, more or less expanded above; trichomes 6-10 μ diameter, aerugineous; articulations about as long as broad below, one third to one quarter as long above, subtorulose, tapering gradually to a hair-like termination; heterocysts basal, globose or oblong.

It resembles *R. minutula* (Kuetz.) Born. & Flah., but the thalli are much firmer, and not at all encrusted with lime; the trichomes are slenderer, and the filaments more densely packed. In some particulars it agrees with the description of *R. Beccariana* (De Not.) Born. & Flah., Revis. des Nost. Het., part 2, p. 56; but the latter has more slender trichomes, with longer articulations and much narrower sheaths. It grew in abundance at the locality mentioned, in company with *Schizothrix lacustris* var. *caespitosa* Gomont. It has also been found by Professor W. A. Setchell, near Norwich, Conn.

The species here considered have all been distributed in Fascicle XI of the Phycotheca Boreali-Americana; *Cylindrospermum catenatum* as No. 505; *Anabaena catenula* as No. 506; *Rivularia compacta* as No. 508. *Schizothrix Friesii* as No. 503; and *S. purpurascens* v. *cruenta* as No. 504.

MALDEN, MASS.

A PROLIFIC FRINGED GENTIAN. — I have in my herbarium a specimen of the Fringed Gentian, *Gentiana crinita*, Froel, bearing eighty-five flowers. This is certainly an extraordinary number, and it shows what a degree of vitality our small annuals can display under suitable conditions. The plant was collected in a damp meadow in Weston, Massachusetts, by Thomas T. Hinkley, and was given to me fresh the same day. It is 27 inches high, and is just past flowering. As far as I am able to judge, about half of the flowers would have produced ripe fruit. — WALTER DEANE, Cambridge, Mass.

MYOSOTIS COLLINA IN NEW ENGLAND. — An interesting little emigrant from the Old World has recently been collected at the Point of Pines, in the town of Revere, Massachusetts. This is the *Myosotis collina* of Hoffman, which appears to have become well established in damp, grassy land, where it was found in great abundance. It is a low, hairy annual, seldom attaining six inches in height. The spatulate to obovate, scarcely pointed leaves are mostly clustered near the base, a

few extending a short distance up the loose racemes. The ascending stems are sometimes branched, and then always from near the base. The pedicels are barely one third the length of the calyx. The flowers are blue, and very small, and the deeply five-cleft calyx is open in fruit.

Bentham, in the "Handbook of the British Flora," says of this plant, "Flowers in early summer, and dies soon after." How completely this is the case the writer had occasion to observe. The plant was first noted on May 23d, when it was at its best; on June 12th, only a few dried specimens were found, after diligent search.

There is a specimen of this plant in the Gray Herbarium, collected at Edmonton, Ontario, and also one from a cemetery at Ithaca, N. Y., where it is said to be abundant. As far as I am able to find out, this is its first appearance noted in New England. — Emile F. Williams, Boston, Mass.

A NEW WILD LETTUCE FROM EASTERN MASSACHUSETTS.

B. L. Robinson.

(Plate 2.)

An interesting and noteworthy Lactuca has recently been discovered at Marshfield, Mass., by Mr. Charles H. Morss of Medford. In habit and color of corollas it resembles blue-flower specimens of *L. leucophaea*. From this species, however, it is clearly distinguished by its white pappus and broad, flat achenes, which are provided with a short but filiform beak. From our other eastern species, *L. canadensis*, *integrifolia*, and *hirsuta*, it differs not less markedly in its blue flowers and shorter-beaked, more numerously ribbed achenes. All efforts to identify the plant with southern or western types, or with any of the numerous species of the Old World, have proved unsuccessful, and it seems best to place it on record as a new type.

Lactuca Morssii. Stem simple, strict, leafy, 1 to 3 m. high, somewhat hirsute toward the base: leaves runcinate-pinnatifid, mostly 5-lobed, 1.2 to 2 dm. long, about half as broad, borne upon broadly-winged cordate-clasping petioles; the lower leaves sparingly hirsute beneath, upon the midrib and wings of the petioles, otherwise, like the upper ones, quite glabrous; lobes shallowly dentate; terminal segment mostly deltoid or transversely rhombic, rather abruptly acuminate, or in the uppermost leaves provided with a lanceolate apical lobe: panicle ample, 5 to 6 dm. long; branches ascending; heads

very numerous, about 18-flowered; involucre campanulate at the base; bracts purplish tinged, the outer short, ovate, acutish, the inner lance-oblong, obtuse, 8 to 10 mm. long; corollas blue; pappus in the fresh plant pure white, in dried specimens with slight cream tint: achenes lanceolate, black, mottled with patches of brown in the manner of tortoise-shell, rather broadly margined and distinctly 3-ribbed on each face, 4 to 5 mm. long, exclusive of the short green filiform beak (1 mm. in length). — Collected on a reclaimed salt marsh at Marshfield, Mass., by Charles H. Morss, Aug. 14, 1898. Type in Herb. Gray.

In many respects this species shares the characters of *L. leucophaea* and *L. canadensis*, but its broad, thickly-set conspicuously cordate-clasping rather bluntly lobed leaves differ considerably from the ordinary northern forms of these species. Furthermore, the occurrence of natural hybrids between species of such dissimilar fruit-characters seems unlikely. Several specimens of *L. Morssii* were observed, and all maintained their characters with constancy; the achenes, seeds, and embryos were so perfectly developed as to leave little doubt of their fertility; and under these circumstances the writer does not feel warranted in resorting to an unsupported hypothesis of hybridity to account for the origin of this well-marked type.

It is highly improbable that *L. Morssii* is restricted to its Marshfield locality, and it is hoped that every reader, who has an herbarium of New England and Middle State plants, will examine his specimens of Lactuca, especially of *L. leucophaea* and *L. canadensis*, and see whether some of them may not prove to be of this new and interesting species, which may be readily recognized from the above characterization and the accompanying plate, kindly prepared by Mr. F. Schuyler Mathews.

Explanation of Plate 2, — *Lactuca Morssii*, fig. 1, middle of stem; fig. 2, branches of panicle; fig. 3, head; fig. 4, achene. *Lactuca canadensis*, fig. 5, achene. *Lactuca leucophaea*, fig. 6, achene.

NOTES ON SOME FLESHY FUNGI FOUND NEAR BOSTON.

Hollis Webster.

Comparatively speaking, the flowering plants of the New England States, and even their ferns and mosses, are well known. Yet, as an article in this journal shows, the discovery of novelties is still quite possible. If this can be said of the higher plants, it is still more conspicuously true of the lower forms.

Few localities in New England, for instance, or even in the United States, have been studied long enough and carefully enough to make the knowledge of their fleshy fungi anything like complete. The experience of the Boston Mycological Club may be cited to show how much may still be done, even in the neighborhood of a botanical centre. Since its organization, in 1895, its members have brought to the weekly exhibitions of the Massachusetts Horticultural Society an astonishing number of species. This active collecting, stimulated, no doubt, by the curious eagerness, now becoming so general, to know whether this or that toadstool is good to eat, has demonstrated that the Boston region is rich in variety of species; that the range of most species can be easily extended; that many of these species before recorded as rare can no longer be so regarded; and that here, as elsewhere, additions will easily be made to the list of fleshy fungi known to the country or to science.

In furtherance of the intention of this journal to extend the knowledge of the flora of New England, a few notes, as a beginning, are presented here. It is hoped that they may prove of general as well as of more strictly botanical interest, and that they may bring forth similar notes from other collectors, to whom the pages of the journal will be open.

A Boston Lactarius.

Lactarius luteolus Peck. (Bull. Torr. Bot. Cl., **23**: 10: Oct., 1896, p. 412). "Pileus fleshy, rather thin, convex or nearly plane, commonly umbilicately depressed in the centre, and somewhat rugulose, pruinose or subglabrous, buff color; flesh white; taste mild; milk copious, flowing easily, white or whitish; lamellae close, nearly plane, adnate or slightly rounded behind, whitish, becoming brownish where wounded; stem short, equal, or tapering downward, solid, but somewhat spongy within, colored like the pileus; spores globose .0003 in. broad; pileus 2-3 in. broad; stem 1-1.5 in. long, 3-5 lines thick. Dry Woods, East Milton, Mass., August. H. Webster."

Since this species was thus described, it has been found in abundance, and further information concerning it can now be furnished. Specimens are at hand, collected between August 10th and 26th, 1898. Those of the earlier date are already near maturity, so that the species may be looked for in late July, for, like many *Lactarii*, it is of slow growth; those of the later date are already beginning to show signs of age. The plant grows usually in dry situations, though sometimes in moist, well-drained spots, in woods or thickets, under deciduous trees.

Specimens have also been gathered under pines, though not as yet in woods exclusively of pine. It chooses situations similar to those in which the related species *L. volemus* Fr., *L. corrugis* Peck, and *L. hygrophoroides* B. & C. are found, and is likely to be overlooked, or confounded with dwarfed, pale forms of *L. volemus*, which sometimes show scarcely a trace of their characteristic red brown. Its pruinose-pubescent surface and short stem, together with its smaller size, readily distinguish it.

In the button, the margin of the pileus is inrolled. The surface of the pileus at all stages, and of the stem, is covered with a conspicuous white bloom, which easily rubs off, disclosing the yellowish or cream-colored surface beneath. Handling spots the plant, particularly the stem, with dingy brown. The milky juice starts out in huge drops, especially from the lamellae, at the slightest jar. When it dries, it leaves dark brown spots. To gather and carry home specimens that keep the look of the fresh plant is thus a difficult matter.

In age, the plants become dry and tough, with the margin irregularly wavy and turned up. They do not readily decay, and seem to be rather free from attacks of insects.

In the dried plant the yellowish color is most conspicuous in specimens of the earliest collection, in which the very edge of the expanded pileus is still inrolled. The surface of cap and stem is covered (under a hand-lens) with dense, short pubescence. The hymenium is pallid, or, in the older plants, dark brown, and is whitish-pulverulent, except in the interspaces between the gills, where it is as if varnished.

The white spores are globose, echinulate, and 8–8½ μ in diameter. Peck's measurement is smaller.

This Lactarius was observed some years ago by Mr. Julius A. Palmer, who considered it an American form. Specimens sent to Professor Peck, in 1896, yielded the description and name cited at the head of these notes. The plant has been found in various places in Milton, Quincy, the Blue Hill Reservation, Melrose, Middlesex Fells and Lynn Woods, and is reported from other stations not far from Boston.

Notes of its occurrence elsewhere would be of interest, for its range is probably greater than here indicated. Of its edible qualities nothing is known to the writer.

Boletus Russellii Frost.

This Boletus is distinguished from other species in the section *Laceripedes* by its dry squamulose pileus and the color of the stem (vid. Peck. Bull. N. Y. State Mus.: **2**: 8: Sept., 1889, p. 121). Described originally by Frost, the plant, well known in New England, has been reported from New York, and from as far South as North Carolina. It has been deemed rare. During the Boletus season, however, that is, in the first half of August, in 1896, '97, and '98, it was not infrequently collected in deciduous woods about Boston. It is perhaps missed by collectors because, so far as the writer has observed, it is not common on and beside paths in the woods, but is to be sought for when striking across country, off the beaten track. It may be looked for in almost any patch or stretch of dry, deciduous woods, and often in the moister situations. Where it occurs, it is conspicuous by reason of its tall, erect habit and lacerated stem, and is therefore sure to attract the attention of even the most inexperienced collector.

It is generally almost solitary, but occasionally a dozen plants may be found within a square rod. It has been collected and reported from so many places about Boston that it certainly is not rare in that region. In fact, it seems almost as common as *B. alveolatus*, and more so, in the writer's experience, than *B. luridus*. It is rarely much attacked by insects in the early stages, and as it dries well, and without loss of the distinctive characteristics, good herbarium specimens are easily had.

Two Edible Hygrophori.

In the Thirty-fifth Report of the New York State Museum (for 1881, Albany, 1884) are descriptions of two of Frost's species of Hygrophorus, *H. fuligineus* and *H. flavo-discus*. They belong in the section *Limacium*, characterized by a *velum universale viscidum*, and are distinguished by "the abundant gluten which covers the pileus" and the stem, in the button stage. Large, firm species, of rather slow growth, they appear late in the autumn in low pine woods, usually in damp places, and in mixed woods under or near scattered pines. They are four to seven inches in diameter, and the size of their moist, shining caps, which in *H. fuligineus* are dusky or smoky brown, and in *H. flavo-discus* a bright pale yellow, makes them conspicuous. In the unexpanded stage, which persists for some time after the plants push up above the ground, the color is much more intense, and the plants look like

colored balls, covered thickly with white of egg, rising from the leaves or needles. As the stem extends upward to a height of two to five inches, the inrolled margin of the pileus straightens out, often becoming wavy, and finally turns up, bringing the gills into view. The cap at the same time pales, only the disk retaining anything like the marked tint seen in the button, and the gluten hardens, leaving cap and stem dry and shiny, as if varnished. The flesh and rather distant gills are white, and the whole plant exhibits, in a marked degree, that clean, freshly-washed look that is peculiar to the genus. Each button preserves for a time intact its transparent veil, that stretches like a sheet of white of egg from margin to stem. Looking through this veil, you can see that the very top of the stem, for a half inch or so, is dry, white, and smoothly fibrous-striate. In this point the two species differ from many others in the same section in which the stem is floccose or granulose at the top.

Neglecting a slight difference in the size of the spores, the description of one species would answer — except as to color — for the other. Doubts as to whether they are distinct are rather strengthened by the fact that the two occur usually together. Sometimes the association is so close as to suggest a mycelial connection ; but this, if existing, would be difficult to demonstrate.

As found about Boston, in Lynn Woods, and along the North Shore from Salem to Gloucester, the two plants, however, keep their slight distinction well ; and though they have been observed in great quantities, no intermediate forms are known. Moreover, the mycophagists, for both species are edible and much sought after, note a difference between them yet more subtle, a distinction of flavor. The yellow species, they say, is sweet and delicate, whereas the smoky species has a slightly strong or fishy taste — for which it is by some preferred. The yellow one, however, is the general favorite for the chafing-dish, and is familiarly known in this region as the "yellow sweetbread mushroom."

H. fuligineus may be looked for at least by the middle of October. It is sometimes so abundant in its chosen spots as to be unavoidably crushed under foot by anyone who would pass its way, and the troops and patches of it give a strikingly populous aspect to the ground.

H. flavo-discus is ten days or two weeks later in its appearance, so far as observed, and seems not quite so abundant as the other, nor of such wide distribution. Both continue until hard frost.

A striking fact is the close association of both species with pine

trees. Though they are often under other kinds, yet in every case careful examination of the neighboring trunks, or a glance up into the tangle of branches, has disclosed the inevitable pine. It would be interesting to extend the range of these two species, and to know whether other observers have had the same experience.

Matricaria discoidea in eastern Massachusetts. — About three years ago I found *Matricaria discoidea* in Winchester, on a road leading west from Highland Avenue to the north of the village, growing in light shade along the roadside with the common mayweed, which was abundant in this locality. The *Matricaria* covered almost completely an irregular patch about 10 x 20 feet, and was noticeable on account of its thick, dark green and more or less matted foliage, and was apparently driving out the mayweed, although there were a few patches of this plant growing with the *Matricaria*. I next found it, a year ago this summer, growing at the junction of two or three roads about two miles southeast of North Andover. The only habitations near by were two old farm-houses, and the roads were not frequently used. It was growing here with the mayweed, which was, however, not nearly so abundant as in the first locality, neither was the *Matricaria* so well established. The appearance of the plant in the first locality (which I have not been able to examine a second time) would certainly indicate a tendency to spread, and to become well established as a roadside weed, which would make a more attractive ground covering, with less attractive flowers, than the mayweed. I am informed by Mr. Fernald that the *Matricaria* is abundant along roadsides in portions of Penobscot and Hancock Counties in Maine. — Warren H. Manning.

[In sections of eastern and central Maine, where this plant is often the prevailing roadside weed, its pleasant fragrance, when bruised or when drying, has given it the fitting name, *Pineapple-weed*. — Ed.]

At the annual meeting of the New England Botanical Club, held December 2, 1898, the following officers were elected for the year 1899: President, Prof. G. L. Goodale; Vice-President, Judge J. R. Churchill; Corresponding Secretary, E. L. Rand, Esq.; Recording Secretary and Treasurer, Mr. E. F. Williams; Phanerogamic Curator, Mr. Walter Deane; Cryptogamic Curator, Dr. G. G. Kennedy; Councilors, Messrs. N. T. Kidder, F. S. Collins, and B. L. Robinson.

The annual meeting of the Josselyn Botanical Society of Maine, held at Waterville, August 30 to September 2, 1898, was attended by about fifty persons interested in Maine botanical matters. Aside from the valuable committee reports, ten leading papers and addresses were given — by Prof. A. L. Lane, Mr. Geo. E. Davenport, Miss Louise H. Coburn, Prof. Leslie A. Lee, Mr. Merritt L. Fernald, Mrs. G. D. B. Pepper, Prof. W. M. Munson, Mr. Haven Metcalf, Mr. Hollis Webster, and Mrs. Harriet C. Davis. An entire afternoon was devoted to informal discussion of the characteristic vegetation of Maine. Fifteen persons, representing different sections of the state, had been previously asked to prepare concise statements of the prevailing vegetation, with notes on the controlling physical characteristics, of their respective regions. These notes, with the discussion elicited, were of more than passing interest, furnishing very important data on the distribution of well-known species. Two days were spent in pleasant field excursions, which resulted in the discovery of some species quite new to the state, and in the extension of the known ranges of many others.

The following officers and committees for the present year were elected: President, Prof. A. L. Lane; Vice-Presidents, Prof. Leslie A. Lee, Miss Kate Furbish, Miss Mary A. Clark, Mr. Edward L. Rand, Miss Nellie F. Mansfield, Miss L. S. Eaton; Secretary, M. L. Fernald, Gray Herbarium, Cambridge, Mass.; Assistant Secretary, Mrs. F. T. Stevens, Holyoke Place, Cambridge, Mass.; Treasurer, C. H. Knowlton, 4 Mt. Auburn Street, Cambridge, Mass.

Committee on Plant Distribution, M. L. Fernald, Miss Kate Furbish, J. C. Parlin, C. H. Knowlton.

Committee on Plant Lore, Mrs. H. K. Morrell, Gardiner; Miss Mary F. Farnham, Rev. B. P. Snow, H. K. Morrell, Mrs. M. P. Salsman.

Committee on Bryophytes, J. F. Collins, 126 East Avenue, Providence, R. I.; Miss Mary A. Clark, E. L. Rand, Mrs. F. T. Stevens, E. B. Chamberlain.

Committee on Algae, F. S. Collins, Dexter Street, Malden, Mass.; Prof. F. L. Harvey, Haven Metcalf.

Committee on Fungi and Lichens, Miss Kate Furbish, Brunswick; Miss Clara E. Cummings, Mrs. Harriet C. Davis.

Regular weekly exhibitions of fleshy fungi were made during the season of 1898, from May until the middle of November, by the Boston Mycological Club, on Saturdays, at Horticultural Hall, Boston.

The favorable weather conditions, and the activity of a large number of collectors, brought out a great number of species characteristic of eastern Massachusetts, and established this kind of display still more firmly in the public interest.

During the close season the Mycological Club meets on the second Monday evening of each month, at the rooms of the Boston Society of Natural History. At the October meeting, Miss Helen M. Noyes gave an account of our common puff-balls. The November meeting was devoted mainly to the genus Pleurotus, and the December meeting to the Phalloideae, with remarks upon Calystoma. At the January meeting, a paper by the President is expected on "Mycology in a City." The officers of the Club for the current year are: President, Dr. G. E. Francis; Vice-President, Wm. C. Bates; Secretary and Treasurer, Hollis Webster; Executive Committee, the foregoing and G. B. Fessenden, Dr. R. T. Dearborn, Mrs. F. H. Pierce, and Miss M. C. Hallett.

In a recent Bulletin of the Natural History Society of New Brunswick (No. XVI, 50), Dr. W. F. Ganong describes the occurrence, in the interior of that province, of colonies of salt marsh plants. These halophytic plants are associated in New Brunswick with salt springs, as are also similar species near Syracuse, New York. Such colonies should be sought in New England, and their occurrence carefully noted. Aside from the interest they arouse among botanists, these isolated groups of plants, far removed from the normal limits of their range, furnish the geologist valuable data regarding the earlier history of the regions where they occur.

Among the articles promised for early numbers of Rhodora are résumés of the history and work of the various botanical associations in New England, including the N. E. Botanical Club, Boston Mycological Club, Josselyn Botanical Society, Vermont Botanical Club, etc.; also a careful list of New England local floras, with notes upon their fullness, territorial scope, and, whenever possible, information where and at what price they can be obtained. Announcement of local floras now in preparation will be gladly added, to the extent that information is received.

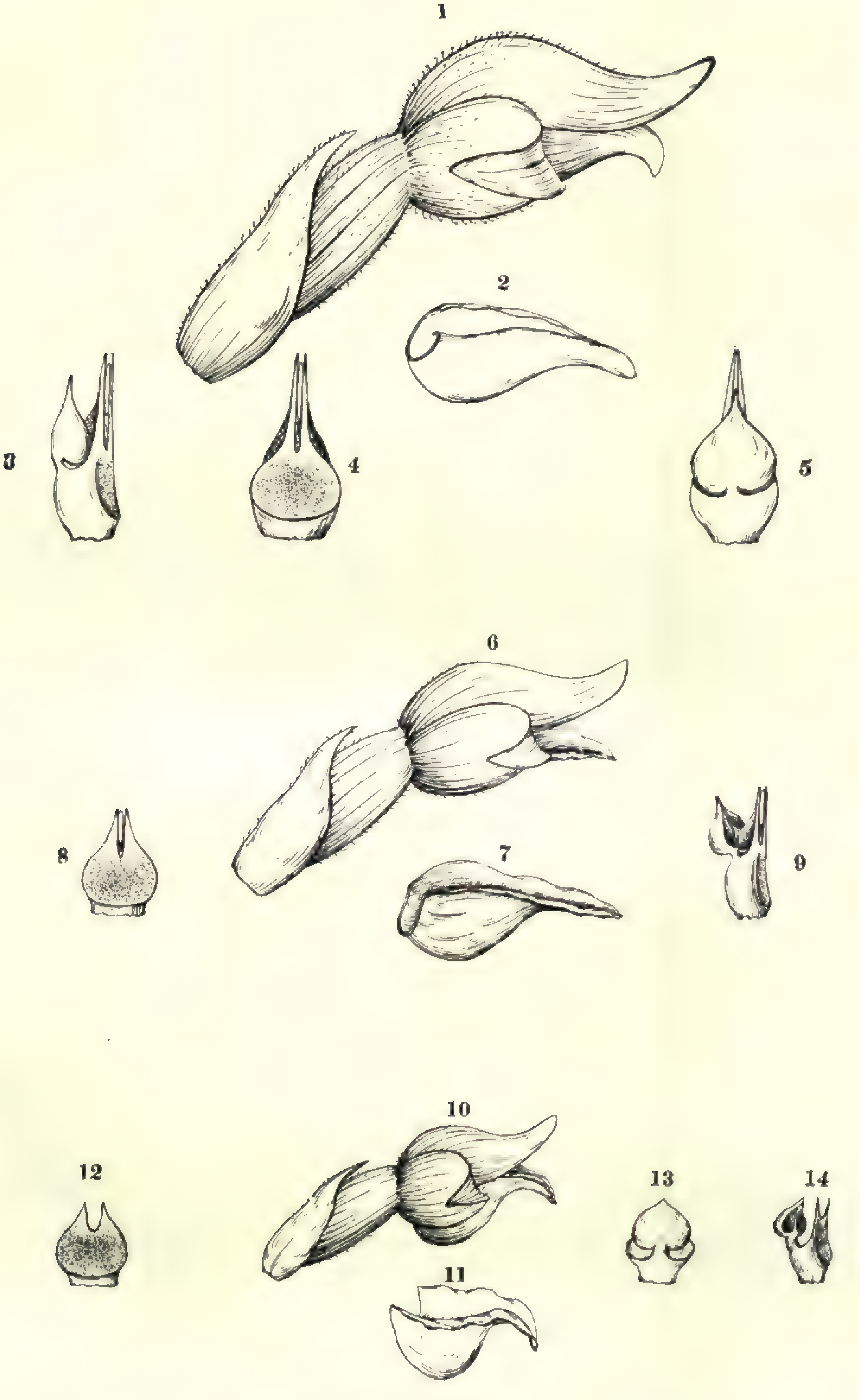

Fig. 1–5, Goodyera Menziesii. Fig. 6–9, G. tesselata. Fig. 10–14, G. repens.

Fig. 1–4, Lactuca Morssii. Fig. 5, L. canadensis. Fig. 6, L. leucophaea.

Rhodora

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A CASE OF BOLETUS POISONING.

F. S. Collins.

Within the past few years there has been a great increase of general interest in mushrooms, chiefly as articles of food, and probably ten persons now collect and eat them to one that did so ten years ago. The literature treating of fungi, as a food supply, is becoming quite extensive, and much accurate instruction has been given for distinguishing edible from noxious species. But there is naturally a number, it is to be hoped not a large one, of persons whose enthusiasm for their favorite pursuit outruns their knowledge. Not long since the assertion was made by a person of some authority in the mycophagic cult, that "all *Boleti* are edible."[1] Probably Rhodora will reach only a small proportion of the persons who saw this statement; but to some, perhaps, a statement of my experience with the question — not, indeed, whether all *Boleti* are edible, but only whether species described and figured as edible are safe — may be of use.

While there are instances of mycologists losing their lives by eating the wrong mushroom, I think there are not many cases where any person interested in botany has been seriously poisoned in this way, and afterwards published the particulars; so that perhaps some fullness of detail in my case may be not unsuitable.

On Saturday afternoon, September 6, 1890, I found in the Middlesex Fells woods, near the edge of Spot Pond, a colony of *Boleti* in excellent condition, of which I picked and took home quite a quantity. I have never been an enthusiast in mycology, but for several years previous to the time mentioned I had been accustomed to collect and eat such edible forms as I happened to find. I had never made any special study of the subject; I had consulted some of the older English works in the library of the Boston Society of Natural

[1] Asa Gray Bulletin, Vol. VI, p. 15, April, 1898.

History, but depended chiefly on Mr. Julius A. Palmer's Mushrooms of America, as especially suited to this region.

The plant collected at this time agreed perfectly with Plate VII, fig. 4, in the last-named work. I had often seen the same plant, but am not sure whether I had eaten it; I certainly had never used it except in small quantities with other species. In this case it constituted the entire collecting; and after being kept over night in a refrigerator, away from anything that could affect it, it was broiled, and served as the "piece of resistance" of the Sunday breakfast. Of the eight at table, three did not eat of it, and experienced nothing unusual; three ate sparingly, and had symptoms similar to those I am about to relate, but milder, and at no time were in any danger; my sister and I ate freely.

After breakfast, at about half past eight, I took a walk in the woods with my two sons, returning about half past ten. Just before reaching home, I felt a sense of oppression and a sort of rising in my stomach, and soon after had an attack of vomiting, followed in about fifteen minutes by another attack, and then others at shortening intervals. I found that my sister, who had remained at home, had been attacked in the same way, but more severely. The doctor had been called by telephone at the beginning of the attack, and had responded promptly, but when he arrived she was in a state of collapse from which the ordinary remedies failed to rouse her; it was necessary for him to use subcutaneous injections of brandy and ether.

By the time he felt safe for her, I was ready for his attentions. I had felt no pain, vertigo, nor headache, and between the attacks I made myself useful, getting brandy from a neighbor and procuring other things needed; but the more and more frequent vomiting, and, after a while, purging, exhausted me. At last I found I could no longer keep on my feet; I looked round to see where that sudden icy wind came from, and at the same instant was conscious of a curious narrowing of the field of vision; it closed up just the same way as an iris diaphragm, leaving a small circular space still available. I was just able to get to bed; suffering no real pain, but cold and helpless. My system was, however, freed from the noxious substance; a good supply of hot, strong coffee warmed me up; I slept quietly, and had no further trouble. It was several days before I recovered my usual strength, and I found myself instinctively walking carefully, almost on tiptoe, as if there were something delicate inside of me that would break if

jarred; but after a while this passed away. My sister's recovery naturally took longer, but after two or three weeks the last symptoms of sensitiveness disappeared.

Some of the other results, however, lasted longer. For quite a while I received newspaper cuttings announcing that a man in Malden, the name usually something like mine, but seldom exactly the same, who considered himself an expert botanist, had poisoned himself and family by toadstools that he mistook for mushrooms. My friends would say, "Why, Collins, how did you make such a mistake? I thought everybody knew that mushrooms were pink underneath."

I am now willing to eat the field mushroom, the fairy ring, and the puff-ball; beyond that I do not care to go on my own judgment; and I doubt if there is any authority that could induce me to eat a *Boletus*, however tempting.

I have given my experience with considerable detail, to illustrate how different the symptoms were from *Amanita* poisoning, and yet how narrow an escape my sister had, if not myself. In neither case was there any vertigo, headache, or acute pain. The symptoms appeared within two hours, and indicated an intense irritant, not a poison, that had affected the system. As soon as the substance was expelled, the difficulty ceased. The danger would seem to be that a delicate constitution would be exhausted before the poison could be expelled.

Within a week after the occurrence, I went again to the locality where the plants grew, and found some still there; but a week makes much difference with fleshy fungi. I sent the best specimens I could find to Prof. C. H. Peck, who kindly examined them for me. He thought the plant was probably *B. miniato-olivaceus* var. *sensibilis* Peck, the doubt being due to the poor condition of the specimens. The next year I visited the place at the same date, and again sent specimens to Professor Peck; and he wrote me that there was no longer any doubt of the correctness of the determination first given.

There is reason to suppose that the plate in Palmer's book was drawn from a specimen of *B. miniato-olivaceus* var. *sensibilis;* the referring it to *B. subtomentosus*, an edible species of Europe, is certainly unfortunate, for this mushroom abounds in the woods in this vicinity; and medical attendance may not be always as prompt as it was in the case of myself and family.

SOME PLANTS ABOUT WILLIAMSTOWN.

Joseph R. Churchill.

It is less than one hundred and fifty miles by rail from Boston, on the coast, to Williamstown, in the extreme northwest corner of the little State of Massachusetts; yet in this short distance, so much tempered is the harshness of our east wind, so elevated and diversified becomes the country as one goes west, with perhaps other differences of soil and climate, that a considerable change in the flora of the two places is soon discovered. Indeed, a botanist may well be surprised at the number of plants in the woods and meadows of the Hoosac Mountains which are rarely or never found near Boston. In the course of two short visits at Williamstown, in early June and in August, 1898, I collected many such plants, including some which I believe are also new or rare in Massachusetts, and some little account of these may be worth putting on record.

Centaurea Jacea, L., is mentioned as a rare plant in Gray's Manual and in the Illustrated Flora of Britton and Brown, and in neither is it credited to Massachusetts. A single large patch grew by the side of the Pownal road near the Sand Springs, where I obtained fine specimens in August. With its long fimbriate sterile ray flowers and large heads, it is a more conspicuous and attractive plant than *C. nigra*, which is common about Boston and elsewhere; and I found that the patch was as much admired and "collected" by the ladies and children in the neighborhood for merely ornamental purposes as by myself for the equally ornamental and more lasting uses of the herbarium. It is curious to find that, according to Anne Pratt's Flowering Plants of Great Britain, *C. Jacea* is of very rare occurrence in England, and it is not mentioned in Hooker's Student's Flora of the British Islands.

Along the lower bare steep slopes of Northwest Hill, near the Hoosac River, I found *Calamintha Acinos*, Clairv. growing abundantly. There is no mention of this species in the Synoptical Flora or in Gray's Manual. In the Illustrated Flora, III, 109, as *Clinopodium Acinos* (L.) Kuntze, it is said to be found "in waste places in New York and New Jersey," and there are specimens in the Gray Herbarium from Ithaca, N. Y., and from Toronto, Canada. The plant in the field has much the appearance of Pennyroyal, but it is a strag-

gling vine with little pungent odor, and the bright pink flowers are larger. I thought at first I had found a long-sought plant, *Isanthus cœruleus*, but that pleasure was reserved until a day or two later, when, in a stubble field near by, I came upon the little stranger growing there in profusion. It was my first introduction to *Isanthus*, which is not definitely located in Massachusetts in the Manual, the Synoptical Flora, or the Illustrated Flora, and it does not appear in our local lists.

Two other mints, close relatives and neighbors in the manuals, I also found near each other in North Adams, near Williamstown. I had never seen *Thymus serpyllum*, L., and *Origanum vulgare*, L., before, but the chief interest, withal, was in the association of these old English plants with Shakespeare and the English classics. The Thyme grew in an open meadow at the base of Greylock Mountain, not far from the beginning of the carriage road which leads from the Notch road to the summit; and, as if scrupulously mindful of the habitat assigned to it in Oberon's pretty line,

"I know a bank where the wild thyme blows,"

it was dutifully growing in round patches, each no larger than a dinner plate, upon a low bank which sloped steeply down to a swale. It was a warm midsummer day, the plant was in full flower, and the bees which swarmed about it evidently shared with me the enjoyment of its beauty and fragrance, but not the charm of its novelty. To *them*, I suppose, *Thymus serpyllum* was an old story.

The Marjoram grew scatteringly along woody roadsides, but I found it also in Williamstown, and most abundantly in a limestone quarry in Pownal, over the border in Vermont.

In the same meadow with the Thyme, I collected *Galium boreale*, L., in fruit, *G. Mollugo*, L., in flower, *Dianthus deltoides*, L., and, in a wet place, *Epilobium strictum*, Muhl.

An immigrant from the Rocky Mountains, which has hardly yet reached Boston, but which is already abundant as a weed along roadsides at Williamstown, is *Matricaria discoidea*, DC., appearing curiously like our Mayweed (*Anthemis Cotula*, L.), but scentless when fresh and without rays.

The Agrimonies, as recently revised by Mr. E. P. Bicknell (Bull. Torr. Club, **23**: 509), presented another example of the difference in the flora here and at the eastern end of the state. I found that *A.*

Brittoniana, Bicknell, was the prevailing form, everywhere taking the place of *A. Eupatoria*, L., var. *hirsuta*, Muhl. (*A. hirsuta*, Bicknell), which is the form common about Boston.

So in *Sanicula*, where again Mr. Bicknell has so satisfactorily cleared up the obscurity among our four species. *S. Marylandica*, L., *S. gregaria*, Bicknell, and *S. trifoliata*, Bicknell, I found in their appropriate habitats, relatively abundant, in the order named. While the first is equally common at Boston, *S. gregaria* is certainly rare, and *S. trifoliata* is probably not found east of the Connecticut River.

On a wet wooded bank above Broad Brook, at "White Oaks," in Williamstown, I collected *Cypripedium pubescens*, Willd., and *C. parviflorum*, Salisb. (with specimens quite intermediate between the two), and *C. spectabile*, Salisb., which flowered in June between the dates of my visits.

In the "Hopper," the great ravine in the west side of Mount Greylock, were growing *Orchis spectabilis*, L., the early *Spiranthes latifolia*, Torr., *Liparis liliifolia*, Richard, and *Uvularia grandiflora*, Smith. Hidden in dark places, I found the fragrant, pretty, and delicate "Squirrel Corn," *Dicentra Canadensis*, DC.; and later, in August, *Goodyera repens*, R. Br., was abundant under the great spruces which happily still cover much of the mountain sides. Let us hope that the commissioners in charge of the new Greylock Reservation, which now includes this primeval forest, will appreciate the rarity in Massachusetts of such woods, will preserve them in their ancient and natural beauty, and never sacrifice them to those methods, so prevalent near Boston, which substitute the landscape garden for the forest; foreign trees for our native species; and graveled walks, with granite retaining walls, for the rocks and wild woodland paths.

August 14, the last day of my stay, I was able to get flowering specimens of *Conioselinum Canadense*, T. & G., from the White Oaks swamp, where I had detected its foliage early in June.

There were other noteworthy plants, and, especially, many interesting grasses and sedges, but they must be deferred. The "Sand Springs" in Williamstown, where I tarried, is in the midst of a most beautiful section of New England, and of a most happy hunting-ground for the botanist.

Boston, Mass.

AMPHICARPAEA PITCHERI IN NEW ENGLAND.

W. P. Rich.

Plants of *Amphicarpaea Pitcheri*, T. & G., have been collected in recent years in two localities in eastern Massachusetts. It was first observed by the writer at Winchester, August 21, 1887, growing in a thicket on the border of Mystic Lake, and again on August 25, 1893, it was found in the damp woods of Oak Island, Revere. A comparison of these specimens with typical ones from the western states shows them to be identical with that species. Abundance of *Amphicarpaea monoica* was growing near at hand in both locations, but *A. Pitcheri* was found on slightly higher and drier ground and in more open spaces of the woods.

The most eastern point in the United States from which this plant has heretofore been recorded is western New York, hence to eastern Massachusetts is a stride that may well attract attention. It is, of course possible that the western species had been accidentally introduced into this section of the country, although the localities where the specimens were found would not favor such an explanation of their occurrence here. I am rather of the opinion that, owing to certain conditions of soil and exposure, our *Amphicarpaea monoica* sometimes attains to the necessary robustness and passes into *A. Pitcheri*.

During the past season I have revisited the localities where the specimens of *A. Pitcheri* were previously collected, and while unable to find any more plants that would pass for this species, there have been found some forms that appear intermediate between it and *monoica*, which intergradation has already been suggested in the Illustrated Flora, Vol. II, p. 334.

While typical *Pitcheri* and typical *monoica* contrast strongly in general appearance, by reason of the stouter habit and denser pubescence of the former, and may therefore well remain as separate species, yet in a series of specimens which I have collected, all the characters which are usually noted in the separation of *Pitcheri* are to be found in our eastern plants. In slender plants of *monoica*, the bracts of the racemes are two millimeters long, making the peduncles of the flowers longer than the bracts. In stouter specimens, these bracts enlarge to four millimeters, equaling in size the bracts of *Pitcheri*, and thus causing the peduncles to be shorter than the bracts, which is one of the characters of *Pitcheri*. The pods of the petaliferous flowers in

typical *monoica* are glabrous, excepting on the margins, yet in more robust plants pods are found which show pubescence all over, as in *Pitcheri*. In the pubescence of stem and leaves, *monoica* is very variable, being sometimes nearly glabrous, sometimes covered with rather copious, coarse spreading hairs, almost as in *Pitcheri*. In the thickness of the leaves, also, there can be noticed a tendency in large plants of *monoica* toward the rougher and thicker leaves of *Pitcheri*. In regard to the subterranean fruiting of the species, I have observed that in smaller plants of *monoica* there is usually an abundance of small one-seeded fruit, seldom over eight millimeters in diameter, while in the forms tending toward *Pitcheri* they are fewer in number but larger, attaining a diameter of twelve millimeters.

These notes are offered as a possible explanation of the occurrence of *Amphicarpaea Pitcheri* in New England.

FAIRY-RINGS FORMED BY LYCOPODIUM INUNDATUM.

B. L. ROBINSON.

WHILE visiting, on the 20th of July, 1898, the sandy shores of Gilmore Pond near Jaffrey, N. H., I was attracted by some exceptionally fine specimens of the dwarf club-moss, *Lycopodium inundatum*. This species is reputed rather rare in America, but it has already been noted at a considerable number of stations, and where it occurs at all it is apt to be abundant. Therefore, the terms *infrequent*, or *somewhat local*, are probably the strongest which should be employed to express its rarity.

The striking feature of the specimens observed was that they grew in more or less definite rings, not unlike the so-called "fairy-rings," formed by various species of fungi. More than fifty of these rings were observed, together with various regular and irregular patches and segments of curves. The rings varied from 7 dm. to 4 m. in diameter, the circumference being formed by a more or less regular band of prostrate vegetative shoots, which at the numerous forkings threw up abundant fertile stems.

This mode of growth in rings seemed so interesting that I made, during this and several subsequent visits to the pond, such observations and records as limited time permitted. In transferring to paper, on a

reduced scale, the position of the stems in a ring, a mechanical device was found useful. This consisted of four laths of equal length, fastened together at the ends so as to form a square, which was then strung with numerous cords running at equal, carefully measured intervals and crossing each other at right angles. This network, when laid over a ring, gave at once a sort of latitude and longitude by which the position of the different parts could be told very readily.

Slight examination showed that the rings develop in the most natural way. A young plant, starting from a centre, sends out its prostrate forking stems in all directions, until soon a small patch of ground is pretty uniformly covered with the stems. These areas, although subject to irregularity from obstructions, are usually about circular. Several were observed which were from 2.5 dm. to 4 dm. in diameter. Now, it is a well-known fact that the prostrate stems of *Lycopodium inundatum* as they grow, constantly root near the tip, while the older parts begin to die and decompose. Anyone who has collected the species will recollect that his specimens, no matter how carefully selected and dug, are pretty sure to consist only of a single short, slightly branched stem, fresh and green at one end, but yellow and decayed at the other. With this mode of growth and the early tendency of the stems to develop radially or centrifugally, the formation of the rings is at once explained. The older parts of the plant, which are at the centre, are the first to die away, and what is left is a ring of separate, diverging branches of what was once a single plant. These continue to grow as independent individuals.

As the branches grow outwards at their vegetative tips, their inner, older ends gradually die and so the rings get larger year by year. The size of the ring is thus an approximate indication of the age of any particular colony. The stems appear to grow from 2 to 3.5 dm. in one season; a ring would, therefore, add nearly a foot to its radius each year, and its age be roughly found by halving its diameter expressed in feet.

It is not maintained that the rings are always so perfect as our theory would make them. There are several obvious sources of irregularity. The chief of these are the crowding of other plants, inequalities of the ground and especially the fact that neighboring rings often become confluent and confused. In several cases reëntrant bands of stems were observed, which seemed again developing into the hollow of the ring. However, making all due allowance for irregularities, the

rings on the shores of Gilmore Pond were sufficiently clear to demonstrate that this annular mode of growth was not merely a theory, but a distinct tendency.

In other localities, where I have collected *Lycopodium inundatum*, it grew in peat moss, and there no rings were observed. This, however, is not surprising. The surface of a peat bog, covered with undershrubs and tussocks would offer no such opportunity for regular development as an open sandy beach. It is hoped that persons, who find *Lycopodium inundatum* during coming seasons, will report any similar ring formations which they may observe in other localities.

One more circumstance of interest may be mentioned regarding the rings on Gilmore Pond, and that is that they were never quite circular, but when of regular growth at all, were always broadly elliptical. Furthermore, the ellipses were in nearly all cases so situated that their longest axes were parallel with the margin of the pond. This relation appeared to obtain at different places upon the curved shore and be quite independent of the points of the compass. The most natural inference is that the Lycopodium, in the manner of many other littoral plants, tends rather to develop *along* the shore in a region of tolerably uniform moisture, than toward or from the water, which would bring it into wetter or drier ground. It is true, the rings were found at very different distances from the water, varying, indeed, from six to thirty meters.

[Since the above was in type, we have received from the publishers (Messrs. Ginn & Co.) Prof. W. J. Beal's attractive little volume, *Seed Dispersal.* On page 5 of this work — which is popular in style, well arranged, and excellently illustrated Prof. Beal describes some "fairy-rings" formed by *Monarda didyma*, the bee-balm, and refers to similar tendencies toward annular development in several other flowering plants. — ED.]

NOTES ON CALOSTOMA.

HOLLIS WEBSTER.

A RATHER common, though unfamiliar fungus of our woods, one that is sure to excite the curiosity of anybody who happens on it for the first time, is the slimy red puff-ball, *Calostoma cinnabarinum* Desv. It grows by brooks and by paths where the ground is springy, appearing first as a pale brownish yellow gelatinous lump, from which the

outer coating of jelly soon falls away and exposes a tough dry ball as big as a hickory nut, bright red and with a pretty star-shaped beak or mouth at the top. From this beak a pinch will force a little cloud of yellow dust, the spores. Examination of plants in various stages will show that with the gelatinous coat there falls away, also the outer tough layer (exoperidium) of the puff-ball. Beginning at the base, this layer splits into strips and fragments which curl up inwards and drop to the ground. Below, from the base of the puff-ball, extends a swollen cylindrical mass of coarsely interwoven gelatinous strands, which form a firm elastic footstalk, that is sometimes almost completely buried, but often thrust forth from the ground for two inches or more.

This fungus naturally attracted the attention of some of the early botanists, particularly of Persoon and Desvaux, the latter of whom in 1809 established for it a new genus named from the peculiar structure of the radiately slit valvular mouth. *Calostoma*, which means *Pretty-mouth*, was Persoon's appropriate (specific) name. The further history of the treatment of the plant at the hands of botanists, of the variety of names applied to it, and of the way in which it has been for years confounded with a similar but rarer species described from Carolina specimens in 1822 by Schweinitz, under the name of *Mitremyces lutescens*, is clearly outlined in a paper by C. E. Burnap, in the Botanical Gazette for March, 1897.

At the end of this paper, Burnap gives descriptions and figures, based on a reëxamination of specimens of the American forms, and clearly shows the existence of three distinct American species, viz.: *Calostoma cinnabarinum* Desv., *C. lutescens* (Schwein.) Burnap, and *C. Ravenelii* (Berk.) Massee.

Recent examination of a number of good specimens of the first of these species, and of two specimens of the second, lately added to the herbarium of the Boston Mycological Club, have furnished the following notes.

C. cinnabarinum Desv. The color of the endoperidium and of the inner surface of the exoperidium in the specimens at hand, is a bright, though earthy, brick red; hence Burnap's description of the exoperidium as "ochraceous, often slightly vermilion" seems applicable to old, faded, or rain-washed specimens rather than to fresh plants, from which, under good weather conditions, the outer coating has just fallen away. In such plants the color is intense, and persists strongly even after drying. There seems, however, to be some variability, and

it is possible that the exoperidium may under certain conditions carry away with it more of the intermediate red layer than usual.[1]

The description of the footstalk as "reddish brown" is again quite true of dried specimens, but in the fresh plant, when the strands are swollen with moisture, the color is a pale watery yellowish or greenish yellow.

In old plants gathered after a rain on November 21, 1898, the footstalks were 7-8 cm. long, and 3½ to 4½ cm. wide at the thickest part, narrowing abruptly below the peridium and at the dark, somewhat root-like base. The strands were rarely less than 2 mm. in diameter (except just below the peridium) and often 4-5 mm. They were much branched and anastomosed. After drying (in hot air) the footstalks shrank to the following dimensions: length 4½-5 cm., width 1½-2 cm., diameter of strands ½-3 mm.; and the color changed to a dull red brown. A comparison of these figures is interesting in connection with the description of the next species about which little seems to be known in a fresh state.

The spores, important for the identification of the species, are elliptic-oblong, echinulate or punctate, pale yellow, 17–22 x 8–9 μ (18 x 8–10 μ, Burnap). The plant occurs (about Boston) from July to November.

Calostoma lutescens (Schwein.) Burnap. Burnap's notes on this species were based on two specimens in the Curtis Herbarium. Two specimens, collected in November, 1898, by the Rev. Paul Whitehead, near Richmond, Va., furnish a few additional notes.

The general color of the whole plant (dry) is a pale greenish yellow. About the base of the endoperidium is a stiff collar, rather imperfect but still conspicuous, formed of spreading, somewhat revolute, irregular teeth, basal fragments of the exoperidium which remain attached. Some indication of this collar may be seen in Burnap's drawing (pl. xix, fig. 1), but he makes no mention of it. If it should be found to be characteristic it would offer another means of distinguishing this from the last species, for it seems to indicate that the exoperidium here splits from above, instead of from below. The foot-

1 Desvaux (Jour. de Bot. 2: pp. 94–95, quoted by Massee in his monograph on the genus Ann. Bot. 2: 5, p. 38) remarks as follows: "This plant sometimes loses its color, when it has been dried carelessly, because its color, which is only superficial and does not penetrate the substance of the outer layer of the peridium, consists of a sort of red pruinosity that easily comes off."

stalks are 10–12 cm. long, and 2 cm. wide. One of them tapers upward to the peridium, the other is about as thick there as anywhere. Both are irregularly cylindrical masses of interlaced anastomosing strands, and taper gradually at the base to a blunt tip. They are much larger and longer than those of the preceding species, and show no trace of red or brown color. The diameter of the separate strands (on the exterior of the bundle) is rarely more than 1 mm., and generally less. The spores are pale yellow, globose, verrucose; diam. 7–10 μ.

Records of the early stages and fresh condition of this plant are much to be desired. It has been reported from Alabama, West Virginia and Virginia; but there seems no good reason why it should not be sought in New England, and further notes upon it will be welcomed.

The following key to the American species may be of use: —

Spores *round*, *verrucose*, plant yellowish, . . . *C. lutescens.*

Spores *elliptic-oblong*, *echinulate*, peridium red or reddish, . . . *C. cinnabarinum.*

Spores *elliptic-oblong*, *smooth*, exoperidium persistent in the form of scales all over the yellowish endoperidium. . . *C. Ravenelii.*

NOTES ON THE BRYOPHYTE FLORA OF MAINE. — I.

J. Franklin Collins.

Maine has probably been more neglected by the bryologist than any other New England state. So far as I am able to ascertain only two lists of the bryophytes of any portion of the state have ever been published, and those were both of Mt. Desert and the adjacent islands.[1] The region covered by these lists constitutes only about one third of one per cent. of the area of the whole state.

During the last three seasons, several members of the Josselyn Botanical Society of Maine, have devoted a portion of their time to collecting bryophytes. As this material is gradually being overhauled and determined, it seems advisable to publish an occasional local list, particularly when the localities represented are more or less widely separated, or when interesting additions are to be recorded, thus forming a basis for future work of this nature in each of the regions. It is especially desired that specimens of species not included in these lists be forwarded to the writer.

[1] T. G. White in Asa Gray Bulletin, 1: 2 (No. 1) 1893 and 2: 44 (No. 7), 1894; Rand and Redfield in "Flora of Mt. Desert" (1894).

During the Dover meeting of the Josselyn Society in 1897, one day (July 9) was devoted to an excursion to Mt. Kineo, at Moosehead Lake (Piscataquis Co.). The party arrived, by steamer, at the Kineo landing at twelve o'clock, and departed again at two, thus leaving but a very limited time for collecting on the mountain, which is situated about fifteen or twenty minutes' walk, perhaps, from the landing-place. Only four of the party made any attempt to gather mosses. Of these Mrs. M. L. Stevens and Mr. M. L. Fernald collected along the base of the cliff, while Mr. E. B. Chamberlain and the writer ascended the mountain by the artificial steps, thence along the path leading to the "look-off" at the top of the cliff.

Between fifty and sixty specimens were collected, representing nearly half as many species. Following is the list, the Hepaticæ having been kindly determined by Dr. Evans. The last species has not, to my knowledge been hitherto recorded for the state. A few doubtful specimens are not included.

Mt. Kineo Bryophytes.

Dicranum montanum Hedw., *D. longifolium* Ehrh., *D. fuscescens* Turn., *D. scoparium* (L.) Hedw., *D. undulatum* Ehrh., *Leucobryum glaucum* (L.) Schpr., *Ulota Ludwigii* Brid., *Bartramia pomiformis* (L.) Hedw., *Webera nutans* (Schreb.) Hedw., *Bryum cæspiticium* L., *Mnium cuspidatum* Hedw., *Aulacomnium palustre* (L.) Schwægr., *Diphyscium foliosum* (Web.) Mohr., *Pogonatum alpinum* (L.) Roehl., *Polytrichum piliferum* Schreb., *P. juniperinum* Willd., *Thuidium recognitum* (Hedw.) Lindb., *Hypnum crista-castrensis* L., *H. Schreberi* Willd., *Blepharostoma trichophyllum* Dum., *Ptilidium ciliare* Nees., *Scapania nemorosa* Dum., *Lepidozia reptans* Dum., *Jungermannia quinquedentata* Web.

This list undoubtedly gives but a poor idea of the bryophyte flora of the mountain, except perhaps in the case of the commoner species, owing to the limited time for collecting. As stated above, however, it may serve as a basis for a more careful exploration, and other collectors who have more time at their command will doubtless find other and less common species in this easily accessible region.

Another mountain, much more difficult to reach than Kineo, is Saddleback Mountain, in Franklin County. This was visited on August 17, 1895, by Mr. Fernald, who collected six mosses and five hepatics at the summit, about 4,500 feet altitude. The list, which follows, is

rather interesting so far as the flora of Maine is concerned. Three species (those preceded by the asterisk) seem to have been unrecorded for the state. Most of the Hepaticæ were determined by Dr. Farlow.

Mt. Saddleback Bryophytes.

Dicranella heteromalla (L.) Schpr., *Webera nutans* (Schreb.) Hedw., **Pogonatum capillare* (Rich.) Brid., *P. alpinum* (L.) Roehl., *Polytrichum piliferum* Schreb., *Plagiothecium denticulatum* (L.) Br. Sch., *Ptilidium ciliare* Nees., *Scapania nemorosa* Dum., **Jungermannia Michauxii* Weber., **J. minuta* Crantz., *Marsupella emarginata* Dum.

A few remarks on the geographical distribution of the species which appear to have been hitherto unrecorded for the state may be of interest.

Jungermannia quinquedentata is recorded for Greenland, Labrador, Gaspé, Ontario, Manitoba, Rocky and Galton Mountains, and, in a general way only, for New England. It is also found in Europe and Asia. No description of this plant is found in any of our American manuals. It is closely related to *J. barbata* — one of our most common hepatics — and many authors doubtless still consider it a form of that species, though recent writers generally segregate several closely related species, as is pointed out by Dr. Evans.[2]

J. Michauxii is recorded for Gaspé, Nova Scotia, Ontario, British Columbia, and Virginia. It was collected by the writer, in August, 1896, near the summit of Mt. Bigelow, Me., and again at Jerusalem, Me., a few days later. It also occurs in northern Europe.

J. minuta ranges through northern Europe, Asia and America. Recorded from Greenland, Labrador, New England (no state mentioned), Western Ontario, Rocky Mountains, and Alaska. This was also collected near the summit of Mt. Bigelow, Me., in August, 1896.

Pogonatum capillare is a plant of temperate and arctic regions. It occurs in Asia, northern Russia, and Scandinavia. In America, it is recorded for Alaska, Greenland, Newfoundland, Miquelon, and for several of the higher mountains in the northern United States, Mt. Mansfield, White, Adirondack and Rocky Mountains.

The occurrence of all these species in Maine is not unexpected, as the known distribution of each would indicate, in a general way, that it might be expected in the state. It is not unlikely that some of these species may have been collected in Maine by other botanists, but if

[2] Plant World, 1: 98.

such is the case, I doubt if they have made the fact generally known. These notes of their occurrence there may be regarded as helping to fill a gap in their recorded geographical distribution, rather than materially extending their range.

Providence, R. I.

A SPURLESS HALENIA FROM MAINE.

M. L. Fernald.

During the past two seasons, while collecting the spurred-gentian in various parts of Maine, my attention has often been attracted by a plant, which, in flower, seems more like a species of the true gentian, *Gentiana*. Though the plant is habitally identical with the common *Halenia deflexa*, and it occurs in similar or even the same situations, most of its corollas entirely lack the spurs, which, superficially, distinguish the spurred-gentians from the true gentians. Since the plant was first noticed on the gravelly wooded banks of the Meduxnakeag River, in Houlton, it has been carefully watched at other stations; and it has been noted that occasionally the first flowers produced by the plants bear the spurs so characteristic of *Halenia deflexa*, while the later flowers are quite spurless, so that the plant bears flowers seemingly typical of both the genera, *Halenia* and *Gentiana*.

Early in this century a similar plant, collected in Newfoundland by Miss Brenton, was described by Grisebach as *Halenia heterantha*, with an excellent plate identical with the Maine specimens, in Hooker's Flora Boreali-Americana. Commenting upon the absence of the spurs, Grisebach remarked "this abortion, however, affords no reason to doubt of the constancy of the generic characters of *Halenia*, since the genus is as well limited by the structure of its ovarium and by the insertion of its seeds, as by its spurs." That the plant should be referred to *Halenia* there can be no doubt; but, in view of the identical habit of the two plants, and the frequent occurrence in *H. heterantha* of some spurred corollas not distinguishable from those of *H. deflexa*, it seems that the plants should scarcely be treated as specifically distinct. They are, rather, extremes of a single specific type; and, in proposing the following disposition of the spurless form, it is felt that the true affinities of the plants are better shown than if they are treated as distinct species.

HALENIA DEFLEXA, Grisebach, var. **heterantha.** Similar to the species, but with the corollas all spurless, or only the earliest bearing spurs; the lower spurless flowers mostly smaller than the others. — *H. heterantha*, Griseb. in Hook. Fl. Bor.-Am. ii. 68, t. 156 B. — Originally collected in Newfoundland (*Miss Brenton*) and subsequently on the Caribou Islands, Labrador (*Martin*). Recently found by the author at a number of Maine stations, — Houlton, August, 1897; Island Falls, September, 1897; Mattawamkeag, East Eddington and Winslow, September, 1898, — growing by itself or with the typical spurred form, on damp gravelly wooded banks, or on pasture-knolls.

Occasionally plants of this spurless variety are found with the flowers singularly contorted and converted into clusters of foliaceous bracts. Both the variety and the typical plant may be looked for, from late July to September, in New Brunswick, Maine, and western Massachusetts. Only one station for the species, and that in the northern portion of the state, is given in Perkins's list of Vermont plants; and, so far as we are informed, the plant has not been collected in New Hampshire, not even in the White Mountains. Reports of either form of the species in those states or elsewhere in New England will be of great interest, since its distribution in New England, as now understood, is decidedly unique for a plant of so general occurrence a little further north; most boreal plants which reach western Massachusetts being abundant, at least in the mountains, in New Hampshire and Vermont.

THE NEW ENGLAND BOTANICAL CLUB.

E. F. WILLIAMS.

THE New England Botanical Club was established on December 10th, 1895. A number of gentlemen interested in Botany met on that date at Professor Farlow's house in Cambridge, and before the evening was over an association was resolved upon and committees appointed to accomplish its organization.

As far as we are able to ascertain, this is the first club established, in the words of its constitution, "for the promotion of social intercourse and the dissemination of local and general information among gentlemen interested in the flora of New England."

That the time was ripe for the formation of such a club was made evident, when Mr. Warren H. Manning, in the spring of 1894, undertook the formation of an herbarium to represent the flora of the Boston

Metropolitan Parks. Mr. Manning requested the coöperation of all the botanists of the vicinity, and when they assembled it was noticed with surprise that the majority of them were strangers to one another. Until this time, many had carried on their studies and investigations entirely alone, the most favored ones having worked in little coteries of a few individuals. Of course, the professional botanists had reaped the advantage of their official connections, but the vast number of patient, diligent and observant workers, to whom botany is the pastime and pleasure of leisure hours, were slowly plodding their way into the mysteries of nature unaided by the advantages that are now offered so liberally by this club. Not the least disadvantage of this lack of interchange of experience was that some of the labor of these solitary investigators was misdirected, while much of it was many times duplicated.

The many excursions in common and the meetings called by Mr. Manning were a great stimulus to the botanists participating in the work on the Park Flora and in several quarters plans for the formation of an association were broached and discussed, but it was not until late in 1895, that some of the Cambridge botanists, under the leadership of Professor Farlow, Dr. Robinson, Mr. Walter Deane, Mr. E. L. Rand and a few others took the matter earnestly in hand and called the meeting which resulted in the formation of the club.

At first the meetings were held at the houses of some of the members, but by the summer of 1896, the club had grown to such proportions that it became necessary to find larger quarters and since then the club has met monthly, except during July, August and September, at the house of the St. Botolph Club in Boston. The membership consists now of forty-six resident and thirty-seven non-resident members. They represent every sort of vocation, showing how general is the interest in the study of plants. The professional botanists naturally are most numerous, and represent a considerable proportion of the higher educational institutions throughout New England. It speaks well, however, for the cultivation of the American business class, that it contributes to the club almost as many members as the professional botanists themselves, the remainder of the membership comprising teachers in the public and private schools, physicians, lawyers, literary men and men of leisure, but not of idleness, this favored class furnishing some of the most efficient members of the club.

An herbarium of New England plants has been established, which

now comprises nearly 12,000 sheets of well mounted and carefully identified phanerogamous plants and a large and valuable cryptogamic collection, which is not yet fully classified. The club has undertaken the preparation of a critical check-list of the New England plants and a card catalogue of plant stations is now under way.

Many facilities have been provided by the club for members and the meetings are always anticipated with interest and largely attended. It has been the aim of the club to make its advantages readily attainable and therefore the fees have been made merely nominal, the various undertakings of the club being supported by voluntary subscriptions.

STATIONS FOR SOME OF THE RARER PLANTS OF CONNECTICUT.

C. K. Averill.

Asplenium Ruta-muraria L. New Milford on limestone cliffs and ledges, not rare.

Panicum barbulatum Michx. In woods and thickets, Stratford.

Streptopus roseus Michx. New Milford, not common.

Populus monilifera Ait. In the Housatonic Valley at Falls Village, Lime Rock, Newtown; Abundant at Ansonia on the Naugatuck River, about two miles from its confluence with the Housatonic.

Populus balsamifera L. I was surprised to see this tree so far south of its known range, growing along the west bank of the Housatonic River in New Milford, for a distance of a mile or more, where it was shown me by Mr. E. H. Austin.

Claytonia Caroliniana Michx. New Milford, found by Mr. E. H. Austin, rare.

Arenaria Michauxii Hook. New Milford, on dry banks, rare.

Hesperis matronalis L. Bridgeport by roadside.

Tiarella cordifolia L. Kent, rare.

Prunus Americana Marsh. I have found this small tree in only two places, New Milford and Munroe. Since it is very conspicuous in time of flower I conclude that it is rather rare in western Connecticut.

Ptelea trifoliata L. One tall shrub found at Ansonia on meadows adjoining the Naugatuck River.

Polygala Senega L. New Milford, a few plants found.

Acer dasycarpum, Ehr. Occurs in several places on the banks of the Housatonic, from New Milford up into Massachusetts.

Negundo aceroides, Moench. On the banks of the Housatonic River at New Milford, Cornwall Bridge, and Lime Rock Stations.

Kalmia glauca Ait. Spectacle Ponds, Kent.

Lysimachia thyrsiflora L. Growing plentifully on southwest shore of Hatch Pond, Kent.

Fraxinus sambucifolia Lam. Usually rated as rare in Connecticut, but is common in the towns of New Milford and Kent. I have found it also at Trumbull and in Stratford.

Pentstemon laevigatus Solander. Roxbury, a few plants.

Galium boreale L. New Milford and Kent, not rare.

Lobelia Kalmii L. New Milford on wet limestone ledges.

Goodyera repens, var. ophioides, in Connecticut.—In Mr. Fernald's recent revision of the Goodyeras of New England *G. repens*, var. *ophioides*, Fernald, is not reported from Connecticut. However, I have collected this newly recognized variety here at Southington, although in a habitat quite different from that which Mr. Fernald reports as usual.

In dry woods on the top of one of our trap-rock hills are several large, flat boulders. The upper faces of these are a little above the surrounding soil. In the thin crust of soil and humus, gathered in the crevises and depressions of these rocks, grows this little Goodyera. It is well shaded, but otherwise the plant could hardly find a drier location. The time, when it was collected in flower (August 11th), was a little later than the flowering season as given by Mr. Fernald.—C. H. Bissell, Southington, Conn.

Owing to some irregularities in the postal service (due, doubtless, to the exceptionally heavy mails of the New Year season), many copies of our first issue, although promptly posted, were greatly delayed, and others lost, in transportation. Every subscriber, who has not received the January number of Rhodora, can obtain it on application to E. L. Rand, 740 Exchange Building, or W. P. Rich, 3 No. Market Street, Boston, Mass., or to the Preston & Rounds Co., Providence, R. I.

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ETYMOLOGY OF ANEMONE.

C. H. Toy.

THE usual derivation of the name "Anemone" from the Greek ἄνεμος, "wind," is regarded by many persons as unsatisfactory. I am told by botanists that there is no such relation between the flower and the wind as to make the name "wind-flower" a natural one; and it is doubtful whether in early times a plant would be named from its relation to atmospheric conditions — its designation would rather be sought in some more obvious characteristic, as color, odor, or shape. The name is old — it is employed by Dioscorides and Pliny as a well-known name, and it occurs in Theocritus, Theophrastus and earlier writers. The ancient writers differ, however, in the explanation of the term; according to some the plant is so called because it easily loses its flowers in the wind, according to others because it flourishes or does not flourish in the wind. Hesychios and some modern scholars connect the word with a Greek adjective (derived from ἄνεμος) meaning "vain, fruitless." In this uncertainty of the Greek explanation it may be lawful to look elsewhere for the origin of the word. We know that at a very early period Semitic names found their way into the Greek language. The Phœnicians had settlements on the coast of Greece in the thirteenth and twelfth centuries B. C., and left many traces of their residence in names of places and of deities (for example, *Cadmus, Cadmeia, Melicertes, Salamis*). Certain Greek names of plants also (as, *cypress, hyssop, balsam, myrrh, lotus,* and others) are derived from the Semitic. The Arabic name for the red anemone is *shaqāiq an-nu'man,* "the wounds of Nu'mān," which the Arabian lexicographers connect with a king of that name. But this explanation is a bit of folk-etymology. *Nu'mān* is identical with the old-Phœnician (or old-Syrian) *Na'mān,* a deity who was the same with Adonis or Tammuz. The name has been preserved in the Old Testament in a passage

(Isa. xvii. 10) which reads: "though thou plantest shoots for Naamān, etc." These "shoots for Naamān" are the "gardens of Adonis" (baskets filled with plants), which played so prominent a part in the worship of that deity, as a reminder of his tragic death. According to the Greek and Latin writers, it was the blood of Adonis from which the anemone sprang (see, for example, Ovid, *Metamorph.* x. 731 ff.), and Adonis was a Semitic deity, = Na'mān. Out of this last name the Greeks might easily form anemone, assimilating it to their familiar word ἄνεμος, somewhat as our popular speech made *jerusalem* (artichoke) out of *girasole.*

ADDITIONS TO THE FLORA OF WORCESTER COUNTY, MASSACHUSETTS. — I.

Roland M. Harper.

During the season of 1898 I collected in Worcester County a number of plants not enumerated in the latest edition of Joseph Jackson's Flora of Worcester County (1894). The names and stations of those which I have definitely identified are as follows, the families being arranged in the order of Engler & Prantl's Natürliche Pflanzenfamilien: —

Woodwardia Virginica, Smith. Swamp near pumping station, Webster, August 14.

Spirodela polyrrhiza, Schleiden. Cedar-swamp pond, Charlton, August 6.

Glyceria elongata, Trin. Wet places in "Gulf Woods," Southbridge, July 16.

Glyceria pallida, Trin. Cedar-swamp, Charlton, July 16.

Leersia Virginica, Willd. Wet ditch under N. Y., N. H. & H. R. R., Dudley, August 14.

Panicum proliferum, Lam. Damp sand near brickyard, Southbridge, August 27.

Sporobolus serotinus, Gray. Wet meadows and damp sandy places, Southbridge, August 20; Sturbridge, August 28.

Carex communis, Bailey. Dry woods on the east slope of Hatchet Hill, Southbridge, May 15.

Carex laxiculmis, Schwein. Dry woods, etc., Southbridge, June 5; Charlton and Sturbridge, November 13.

Carex pedunculata, Muhl. Rich woods at base of Hatchet Hill, Southbridge, May 15.

Cladium mariscoides, Torr. Lead Mine Pond, Sturbridge, July 31.

Eleocharis Robbinsii, Oakes. In about two feet of water in Lake Chaubunagungamaug, Webster, August 14.

Rhynchospora alba, Vahl. Cedar-swamp, Charlton, July 16; sphagnous bogs and shore of Lead Mine Pond, Sturbridge, July 31; wet meadow, Southbridge, August 20.

Juncus bufonius, L. Roadside ditches, low grounds, etc., Southbridge, July 9.

Polygonum Careyi, Olney. Damp sand near brickyard, Southbridge, August 21.

Polygonum hydropiperoides, Michx. Slow-flowing brooks, in meadows, Southbridge, August 20; Charlton, September 9.

Rumex verticillatus, L. Cedar-swamp, Charlton, July 16.

Arenaria serpyllifolia, L. Roadside in Hillside Park, Southbridge, June 12.

Potentilla recta, L. Same locality and date.

Linum Virginianum, L. Dry woods, road sides, etc., Southbridge, July 6; Sturbridge, July 31.

Bartonia tenella, Muhl. Sphagnous bog, Sturbridge, July 31; dry woods, Southbridge, August 7.

Gerardia purpurea, L., var. *paupercula*, Gray. Shore of Lead Mine Pond, Sturbridge, August 28; damp roadsides, Charlton, September 9; Princeton, September 10.

Aster infirmus, Michx. Dry woods on the west slope of Asnebumskit Hill, Paxton, September 9.

Most of the above are found elsewhere in the state, and would naturally be expected in this county, but many of them are inconspicuous or bear considerable resemblance to other species, and have probably hitherto escaped recognition for these reasons.

SOUTHBRIDGE, MASS.

POISONING BY AGARICUS ILLUDENS.

W. G. FARLOW.

THAT *Agaricus illudens* Schweinitz is a poisonous species, and one not to be eaten with impunity, has been known to mycologists for a

good many years. Since, however, in most cases of poisoning it is difficult to obtain accurate records of the circumstances under which the poisoning occurred, the following detailed account, for which I am indebted to Prof. G. F. Moore of Andover, Mass., is worth placing on record.

In October, 1897, Dr. C. C. Torrey gathered some fine specimens of *Agaricus illudens*, growing on the campus of the Theological Seminary at Andover. The fungi, which were prepared by Mrs. Moore, were fried with a little butter, and eaten at lunch by four persons, viz., Mrs. X., æt. about sixty, Mrs. Moore, Dr. Torrey and Albert Moore, the latter a boy, fourteen years old. The two latter each ate three or four of the fungi; Mrs. Moore two or three, while Mrs. X. only ate a piece as large as a quarter of a dollar. All pronounced the fungus to be of excellent flavor. About an hour after eating, symptoms of discomfort were noticed by Mrs. Moore, but as she is subject to indigestion they were not associated with the fungus eaten. The two ladies went out to drive, Dr. Torrey to play tennis and Albert Moore to school. About three o'clock, that is something less than two hours after the meal, all were taken with free and vigorous vomiting, which continued at intervals through the afternoon. The nausea was not accompanied by burning sensations in the stomach or any other symptoms of poisoning; there was no depression and no disturbance of the bowels at the time or subsequently. In short the fungus acted as a simple but very effective emetic. In the evening the nausea passed off and the next day all were as well as usual, except Mrs. X., who, being something of an invalid, still suffered the nervous consequences of the experiment.

Besides the four persons mentioned there were present at the lunch Professor Moore and a niece, neither of whom partook of the fungi, and neither of whom experienced any of the symptoms from which the others suffered, thus furnishing what may be called a control experiment.

The only treatment employed was an emetic of mustard and salt-water, which the more heroic male members of the quartet took on general principles, followed by a little whiskey. Professor Moore remarks that the remedies used probably had little effect since the *Agaricus illudens* itself took care that the emesis should be thorough and that the whiskey should not stay down.

Last September, I received from Mr. Walter Brem of Morganton, N. C., a specimen of *Agaricus illudens* with a letter asking whether it

was edible. On October 4, a letter was received from Mr. Brem, stating that a lot of the same fungus he had sent me had been served at the State Institution for the Deaf and Dumb with the following result: "Eight teachers and children were poisoned, one very badly, but all recovered. The effect was just as you stated — all suffered from terrible nausea."

Agaricus illudens is frequently found during the latter part of the summer and early autumn throughout the eastern states, and is one of our most beautiful species. It usually grows on stumps near the ground and occurs in large clusters, the beautiful yellowish orange-colored pilei overlapping each other. The species was first described by Schweinitz in 1822, in his Synopsis Fungorum Carolinæ Superioris, and later in 1834, in his Synopsis Fungi Am. Bor. under the subgenus Clitocybe. As the subgenus is now generally kept distinct the name most commonly given to the fungus is *Clitocybe illudens* Schweinitz, although some mycologists have doubts whether the species is strictly a Clitocybe as the genus is now understood. In several respects, *Clitocybe illudens* has a strong resemblance to *Agaricus olearius* Pers., of southern Europe, which is now placed in the genus Pleurotus, although the stipe is hardly more lateral than is often the case with *C. illudens*. Both species resemble each other very much in color and general habit of growth and both are markedly phosphorescent. *P. olearius* is more frequently found on the olive than on other trees, but it also occurs on Carpinus, Populus and some other trees. Like *C. illudens* it is also poisonous when eaten, producing nausea and vomiting and, it is said, purging. *C. illudens* is considered to be a characteristic species of North America, and it is interesting to notice in how many respects it resembles *P. olearius*. The toxicological action of the species is almost that of a pure emetic, acting shortly after ingestion and unlike the emesis caused by narcotic species, as *Amanita phalloides*, in which the action is secondary and does not occur until eight or ten hours after eating. Nor in the case of *C. illudens* is the emesis accompanied by the acute gastric and intestinal disturbance found in poisonous fungi classed as irritants as distinguished from narcotics.

RHODE ISLAND PLANT-NOTES, — I. WASTES.

J. Franklin Collins.

Probably no botanist living in or near a large town or city is ignorant of the fact that the waste-lots and refuse-heaps in the vicinity are prolific sources of botanical surprises. Observations upon the unusual plants of such places, however, though worthy of local note, are usually of little scientific value unless the plants demonstrate their ability to survive adverse conditions of soil and climate and persist or spread.

During the last ten years, I have been considerably interested in these waste spots about Providence, and in 1893, published a few notes[1] on some of the plants found in such situations. Since then additional notes have been made, either upon these or upon later arrivals within our range, and the object of this article is to present, briefly, the more interesting of these later notes. None of the plants here mentioned are listed in the latest catalogue of Rhode Island plants, published in 1888, and doubtless many botanists will think, with reason, that some of them ought not to be included in such a catalogue. However, I propose to present them in such a way that each reader may, to a certain extent, be his own judge as to the value or worthlessness of each as a member of our state flora.

Nearly all species mentioned are represented by specimens in my herbarium, and all were, unless otherwise noted, collected on the wastes about Providence, by the writer. For the purpose of making these notes a little more complete, I have inserted the names (marked with*) of the few plants of waste places mentioned in my notes of 1893 (l. c.), and the reader is referred to that article for the original observations. Only the later notes are here given.

Artemisia Kansana Britt. [Britt. and Brown's Flora, **3**: 466], has been sent to me from Pawtucket by Miss M. L. McCudden, in sufficient quantity to permit specimens being placed in the Brown University, Gray and New England Club herbaria.

* *Glycyrrhiza lepidota* Pursh, has persisted for the past eight years at one station.

* *Grindelia squarrosa* Dunal, is quite abundant at one station

[1] Bull. Torr. Bot. Club, **20**: 240.

and spreading. The last two are also found in Pawtucket (Miss McCudden).

Lactuca Scariola L. was first discovered in the Elmwood district in 1894. Since then it has spread so rapidly that it now occupies several waste places near its original station to the exclusion of nearly every other plant. It has also extended completely across the city and doubtless much farther. It is becoming deplorably abundant.

Physalis Philadelphica Lam., has persisted at one station for at least seven years.

Salsola Tragus L., (the Russian Thistle). About twenty plants were discovered in October, 1898. A detailed account of this plant and its discovery in Providence, may be found in the Providence Journal, of November 13 and December 31, 1898.

For the sake of brevity, the following plants are grouped under appropriate headings.

1. Plants found on many wastes or roadsides, though not necessarily abundant at each station.

Amarantus retroflexus L., *Brassica juncea* Cosson, *Carum Carui* L., *Tropæolum majus* L.

2. Plants frequently found at different stations.

**Amarantus blitoides* Wats., *Chenopodium ambrosioides* L., *C. Bonus-Henricus* L., *Commelyna Virginica* L., *Galinsoga parviflora hispida* DC., *Helianthus annuus* L., *Ipomœa purpurea* Lam., *Lychnis Flos-cuculi* L., *Mentha arvensis* L., *Petunia* (two garden forms), *Phaseolus vulgaris* L.

3. Plants occasionally found, but less abundantly than those of the preceding group.

Alyssum incanum L., **Artemisia Ludoviciana* Nutt., **Astilbe Japonica* Gray, *Brassica campestris* L., **Carduus nutans* L., *Delphinium Ajacis* L., *Galium Mollugo* L., **G. tricorne* With., *Helianthus petiolaris* Nutt., *Papaver dubium* L., *Saponaria Vaccaria* L., *Silene Armeria* L., **Symphorocarpus racemosus* Mx., *Vicia sativa angustifolia* Serringe.

4. Plants found but a few times (rare).

Alyssum calycinum L., *Coreopsis cardaminefolia* T. & G., *Datura Metel* L., *Dipsacus sylvestris* Mill., *Fœniculum officinale* All., *Funkia ovata* Spreng., **Gypsophila muralis* L. (station now obliterated), *Ipomœa coccinea* L., *Papaver somniferum* L., *Plantago Media* L., *Poterium Sanguisorba* L., *Reseda lutea* L., *Rumex altissimus* Wood., **Scandix Pecten-veneris* L., *Sisymbrium Thaliana* Gaud., *Spinacea oleracea* Mill.,

**Stachys annua* L., *S. Italica* Mill. (not **S. Germanica* L.), *Vicia hirsuta* Koch.

It will be noticed that no grasses are mentioned. These, and a few other doubtful plants, may be added later. Plants that have been collected but once are (with a few exceptions) omitted.

Providence, R. I.

TWO PLANTS OF THE CROWFOOT FAMILY.

M. L. Fernald.

(Plate 3.)

Among the most beautiful early summer flowers in northern New England is a tall white anemone of the river-banks. Growing ordinarily in the crevices of ledges and river-cliffs or on their gravelly talus-slopes, spots rarely visited except by occasional botanists or geologists, this plant is by no means so well known in the regions where both grow as the very attractive, but distinctly less graceful, *Anemone canadensis* (*A. pennsylvanica*). In the Maine station — beneath arbor-vitæ on calcareous-slate cliffs and ledges by the Piscataquis, in Dover — where the tall slender plant has been most familiar to me, it is associated with a host of northern or lime-loving species, as *Cystopteris bulbifera*, *Graphephorum melicoideum*, *Scirpus Clintonii*, *Rosa blanda*, *Amelanchier rotundifolia*, *Vitis vulpina* (*V. riparia*), *Lobelia Kalmii*, and *Erigeron hyssopifolius*.

For several years, while clambering about these rocky banks, supposing the plant to be *Anemone virginiana*, I regularly passed it without special thought. Later, however, when the coarse *A. virginiana*, with its usually insignificant greenish flowers, had become familiar to me, I looked forward to the time when I could study critically the slender white-flowered plant of the north.

In late August, 1897, the plants, then in over-ripe fruit, were carefully examined, and during September fruiting plants were studied also at other points in Aroostook and Penobscot Counties. In the following June (1898) the Dover station was visited, and at that time, June 11, the steep sheltered bank was everywhere flecked with the clear-white flowers of the anemone.

Upon further study, the Dover plant proves to be identical with a

specimen collected in 1829 by J. W. Robbins, on rocky ledges in Castleton, Vermont. Robbins's plant was described in a few words by Oakes as *Anemone cylindrica*, var. *alba*. Later, however, Wood published the same plant as *A. virginiana*, var. *alba*. It has not been generally recognized as a noteworthy form of either species, except perhaps by Professor Peck, who has recently revived Wood's varietal name for a plant "common in the hilly parts of Sullivan county [New York], where it is the prevailing form."[1] Other specimens of the plant have been referred, some to *A. cylindrica*, some to *A. virginiana*, while the New Brunswick specimens have been hesitantly placed at different times under both species.

Observations in the field and study of herbarium specimens show that, in some characters, the northern white-flowered plant is intermediate between *Anemone cylindrica* and *A. virginiana*. In its large clear-white flowers this plant is quite different from the ordinary forms of either of those species with their thick greenish sepals. They do not differ, however, from exceptional specimens with white petaloid sepals of *A. virginiana*. In general habit the plant suggests the latter species, but it is decidedly more slender and graceful and usually more glabrate; and the thin cuneate leaf-segments are much more coarsely and sharply toothed above than are the thickish ovate segments of *A. virginiana*. Like that species, but unlike most *A. cylindrica*, the peduncles of the northern plant are commonly proliferous. The fruiting heads, on the other hand, are not unlike short heads of *A. cylindrica*; but from well-developed heads of that species they are readily distinguished. A series of measurements from herbarium material brings out very well some of the differences in the heads of these three plants: —

	Average length.	Average thickness.
Anemone virginiana (22 heads)	18.25 mm.	13.35 mm.
A. sp. (18 heads)	16.85 mm.	9.45 mm.
A. cylindrica (30 heads)	30.45 mm.	8.00 mm.

In the length of the head, then, *A. cylindrica* much exceeds both the others, while in thickness of the head both that species and the plant of the northern river-banks are greatly exceeded by *A. virginiana*. In another character the head of the white-flowered species is more like that of *A. cylindrica* than of *A. virginiana*: while in *A. virginiana* the persistent styles are spreading, giving the head an echinate appear-

[1] Peck, 47th Ann. Rep. 27.

ance, in the other two plants the somewhat less firm styles remain ascending or often even appressed. These differences in the fruiting heads, as well as the general habit of the small-headed plant, are clearly brought out in the drawing kindly prepared by Mr. Charles E. Faxon.

In the fruiting heads, probably, are found the best marked characters for distinguishing the northern plant from *A. virginiana.* Though the larger white flowers are generally quite distinct they are subject to such variation as to make them a final criterion in determining the northern species only when associated with the habital, foliage, and fruiting characters already emphasized, for the flowers of the small-headed species are sometimes small and those of the large-headed *A. virginiana* are not infrequently petaloid. The *Anemone* of the northern river-banks, however, is a much earlier species than the coarser more southern *A. virginiana.* In its flowering season it more nearly resembles the even more southern *A. cylindrica.* In central Maine the slender white-flowered species of the shaded river-cliffs and sheltered banks is well in flower by the middle of June, and its fruiting heads are practically mature a month later, when the coarse *A. virginiana* of the sunny gravelly slopes and open woods begins to bloom.

The smaller-headed plant, as already suggested, is, in Maine at least, the northern representative of the group including *A. cylindrica* and *A. virginiana.* It is apparently a common plant along all the northern rivers coming south on the Penobscot to Veazie, and on the Androscoggin to Gilead. So far as known its range does not overlap that of *A. cylindrica,* which reaches its northern limit on the lower Androscoggin. In the Penobscot valley, however, its range slightly overlaps that of *A. virginiana.* There the latter species reaches its northern limit in Maine on the dry gravelly esker skirting the river only a mile or two above the cliffs at Veazie, where occurs the southernmost known station of the more slender plant. In such a region of overlapping ranges one might expect to find forms intermediate between the two species, but as yet none have been detected; perhaps because the very dissimilar habitats of the plants, the one on damp sheltered cliffs and ledges, the other on dry sunny gravel, may tend to keep them apart. The slender small-headed plant, differing from the species with which it has long been associated, not only in well marked structural characters, but in range, habitat, and flowering season as well, is here proposed, with confidence that it merits such recognition, as a distinct species:

Anemone riparia. Plant comparatively slender, 3 to 9 dm. high, glabrate or loosely pubescent especially below on the petioles and at the base of the involucre: leaves thin, 3-divided, the cuneate-lanceolate or cuneate-ovate divisions unequally cleft into coarsely and sharply toothed segments, the lateral divisions very deeply cleft: involucre 3-leaved, subtending the 1 to 5 slender elongated naked or involucellate sometimes proliferous appressed-silky peduncles: sepals unequal, oval or obovate, obtuse or acutish, 1.5 to 2 cm. long, thin, clear-white, canescent-tomentose or glabrate without: heads of carpels oblong, short-cylindrical, 1.5 to 2 cm. long, scarcely 1 cm. thick; the slender persistent styles ascending or appressed much as in *A. cylindrica.* — *A. cylindrica*, var. *alba*, Oakes, Hovey's Mag. vii. 182. *A. virginiana*, var. *alba*, Wood, Class Book, 203. — Abundant on rocky banks and in the crevices of wet calcareous-slate ledges along the Piscataquis River, Dover, Maine, collected by the author June 25, 1894, August 31, 1897 and June 11, 1898, no. 2201; also collected at Dover by *Geo. B. Fernald*, June, 1896. Besides the Dover material, specimens from the following stations have been examined: Magdeleine River, Gaspé, Quebec, August 5, 1882 (*John Macoun*, no. 932); shore, Lake St. John, Roberval, Quebec, July 20 1892 (*G. G. Kennedy*); Restigouche Co., New Brunswick, August, 1867 (*J. Fowler*); along the St. John River, Fort Kent, Maine, 1881 (*Kate Furbish*); rocky banks Aroostook River, Fort Fairfield, Maine, July 4, 1893, no. 1, ledges by Meduxnakeag River, Houlton, August, 1897, river-cliffs by the Penobscot, Veazie, September, 1897, and in seepy open ground, Foxcroft, June 11, 1898 (*M. L. Fernald*); rocky banks of the Androscoggin, Gilead, Maine, August, 1897 (*Kate Furbish*); abundant about Willoughby Lake, Vt., June 22, 1892 (*G. G. Kennedy*), June 5, 1895 (*J. R. Churchill*); on rocky ledges, Castleton, Vermont, 1829 (*J. W. Robbins*); also reported by Robbins from "Burlington, and other places in Vermont, also in Uxbridge, Mass."; western New York (*Asa Gray*); reported by Professor Peck from Sullivan County, New York.

Another common northern New England plant of the *Ranunculaceae*, which is not described in the standard works upon that group, and which seems to have been nowhere distinguished in print, is a slender flexuous plant closely related to *Ranunculus abortivus*, L. Aside from its more flexuous habit the plant is quickly recognized, especially in the mid-summer state, by its glossy-green orbicular radical leaves, which generally have nearly or quite closed sinuses. This plant,

apparently first collected by Miss Kate Furbish, has some of the leaves, except for their thinner glossy character, like those of typical *R. abortivus*, and the heads though somewhat smaller cannot otherwise be distinguished from those of that species, which, though less common, occurs apparently throughout the range of the round-leaved plant here proposed as —

Ranunculus abortivus, L., var. **eucyclus.** Stems more slender than in the type; the branches slender and flexuous: leaves very thin and lucid; the basal generally of two sorts, some orbicular with a narrow or closed sinus, others reniform as in typical *R. abortivus*: flowers, achenes, and receptacles as in the species, but smaller. — A common and striking form in central and northern Maine, first collected by *Miss Kate Furbish* at East Livermore, June, 1888, and subsequently at Gilead in 1897. Collected by the author at the following Maine stations, generally in moist woods or on shaded river-intervales: St. Francis, August, 1893; Fort Kent, June, 1898; Fort Fairfield, July, 1893, no. 5; Houlton, August, 1897; Island Falls, September, 1897; Dover, June, 1895; Orono, June, 1898; Waterville, September, 1898. A plant with thicker but orbicular and lucid leaves growing in an open field at North Berwick (*J. C. Parlin* and *M. L. Fernald*) is doubtfully referred here. In Quebec at Tadousac, Aug. 7, 1892, and Roberval, Lake St. John, Aug. 24, 1892 (*G. G. Kennedy*). Collected also in New Hampshire — Ammonoosuc Lake, Crawford Notch, July 4, 1898 (*J. M. Greenman*); Alstead, August, 1898 (*W. L. W. Field* and *M. L. Fernald*), and in western Massachusetts — Williamstown, June 1, 1898 (*J. R. Churchill*).

Explanation of Plate 3. — *Anemone riparia*: fig. 1, small flowering plant; fig. 2, fruiting head. *A. virginiana*: fig. 3, fruiting head. *A. cylindrica*: fig. 4, fruiting head.

Epipactis Helleborine at Stockbridge, Massachusetts. — In August, 1898, while I was in Stockbridge, Berkshire Co., Mass., a lady brought me two or three fresh specimens of an orchid which she asked me to identify. A study of the Manual led me to suspect that it was *Epipactis Helleborine* Crantz, which has been found hitherto only at Toronto, Syracuse and Buffalo. Mr. Walter Deane, to whom I gave the specimen, confirmed my suspicion. The only piece which I preserved is now in Mr. Deane's herbarium.

The plant has been found in but one locality in Stockbridge, under a thick spruce hedge near the village street, in dry ground. There were about twenty-five plants at this spot. The lady, who brought it to me, saw it there first in 1897. — RALPH HOFFMANN, Belmont, Mass.

[Information as to the possible cultivation or artificial introduction of this rare orchid in New England, would be of much interest. — ED.]

AN ANNOTATED LIST OF RARE OR OTHERWISE INTERESTING MOSSES OCCURRING IN OR NEAR PLYMOUTH, NEW HAMPSHIRE.

A. J. GROUT.

Tetradontium Brownianum (Dicks.) Schwaegr. On stones in a cave known as Devil's Den, near the summit of Mt. Prospect, Holderness. This cave is a slanting cleft in a ledge at the top of a line of cliffs. The plants of Tetradontium haven ot the flagellæ of *T. repanda* and seem referable to *T. Brownianum*. They were growing upright on the moist stones near the top of the cave and were not inverted as is frequently reported.

Polytrichum gracile Dicks. On knolls in swampy woods, with *P. Ohioense*, at an altitude of about 1000 feet. The opercula had all fallen from the *P. Ohioense* at the time of collection (August 6), but several remained on the capsules of *P. gracile*, indicating that the sporophyte of the latter matures somewhat later than that of the former.

Dicranum longifolium Ehrh. On stone walls near the summit of Mt. Prospect. The plants on the exposed stones at the top of the wall were markedly different from those at its base. The tufts were more compact and darker colored; the stems were much shorter; the leaves were shorter with costa half the width of the leaf base, or even more.

Dicranum viride (Sull. & Lesq.) Lindb. On decayed stumps, in woods, sterile.

Oncophorus Wahlenbergii Brid. Moist soil, beside abandoned road.

Grimmia conferta Funck. Along moist cracks of the under side of a rocky shelf, Mt. Prospect.

Racomitrium canescens (Timm.) Brid. Sterile; covering several square feet of a ledge over which some water flows in rainy times.

Orthotrichum obtusifolium Schrad. On base of poplar tree in Plymouth Village, mixed with *O. speciosum* and *O. Braunii*. The leaves bore the characteristic oblong septate gemmæ.

Schistostega osmundacea (Dicks.) Mohr. The protonema of this remarkable moss is abundant on the floor of the "Devil's Den" on rocks, earth, and fragments of decaying wood, but a careful search both in autumn and in spring revealed just one solitary sterile plant. Those who have never seen the fresh protonema under the microscope can have no idea of its beauty.

Bryum capillare L. Moist ledges, Mt. Prospect; sparingly fruited; determined by Mrs. E. G. Britton.

Pohlia Lescuriana (Sull. & Lesq.). On moist soil close to a small boulder.

Mnium cinclidioides (Blytt.) Hueb. Growing on the soil in a swampy place, closely interwoven with *Hypnum cordifolium*. Many of the leaves were somewhat denticulate, with projecting cells, as is noted by Mr. H. N. Dixon in his admirable Handbook of the British Mosses.

M. Drummondii Br. & Sch. On rocks near brook with *M. cuspidatum* (L.) Neck.

M. stellare Reich. On humus at base of tree in woods; sparingly fruited.

Anomodon tristis (Cesat.) Sulliv. On trees with *Neckera pennata*; also on rocks.

Pterigynandrum filiforme (Timm.) Hedw. A minute depauperate form of this species has been collected from damp rocks near the summit of Plymouth Mountain; Dr. Best refers it with some doubt to var. minus L. & J.

Hylocomium Pyrenaicum Lindb. On rocks in woods, Plymouth Mountain.

Plagiothecium Muellerianum Sch. Clefts in cliff about one mile from Plymouth Village; Devil's Den, Mt. Prospect. It seems that this species is usually sterile and therefore overlooked. It has a very distinct habit and is easily recognized when once known. The stems and branches are very slender, more so than in any other species known to me, and very much flattened. Under the microscope it is easily recognized by the greatly enlarged and inflated cortical cells of the stems and branches. Sullivant's figure, Icones Musc. Suppl. pl. 66, shows

this character well, but it is so prominent that a cross section is entirely unnecessary in order to see it clearly.

Brachythecium acuminatum (Hedw.) Kindb. On a decayed spot in an elm in Plymouth Village. It may be of interest to note that all the species of Brachythecium listed in my Vermont list have been found in this vicinity except *B. flexicaule* and *B. glaciale.*

Pylaisella velutina (Sch.) Kindb. This species seems to be fairly common. It is much lighter colored than the everywhere present *P. inticata.*

Homalia trichomanoides Jamesii (Sch.) Holzinger, Devil's Den, Mt. Prospect.

Leucodon sciuroides (L.) Schwaegr. Not rare on trunks of trees, but thus far always sterile. Distinguished from *L. brachypus* by its slender-pointed entire leaves with rather narrower median cells. M. Cardot and Mr. H. N. Dixon have both seen my specimens and agree with my determination. There can be no doubt that this species is common in New England, but being sterile is usually confused with *L. brachypus.* Mr. E. Faxon and Dr. Kennedy have collected this species in Vermont.

Rhododendron maximum in Somerset County, Maine. — So far as known *Rhododendron maximum* is found in only two places in the State of Maine. One of these, upon Sebago Lake, has long been known. The other, ninety miles to the northeast, though locally well known, has perhaps never been recorded in a scientific journal. This station, in rather dry and rocky deciduous woods, is on the northeast side of Safford Pond in the western part of Lexington. It is said that as early as 1845, one Nathan Safford, who lived near the pond, found these strange flowers, and that, at that time, only a few square rods were covered by the plants. Now, however, over half an acre is covered with a thick tangle of bushes. These vary in height from six to ten feet as they stand, but they are very crooked and twisted. The fragrant flowers are fully out about July 4, and then many of the inhabitants of the neighbouring towns make annual visits to the spot. The bushes, which are often transplanted, rarely thrive in cultivation. — F. H. Cowan, Farmington, Maine.

THE HERBARIUM OF THE NEW ENGLAND BOTANICAL CLUB.

Walter Deane.

As the exponent of the flora of New England, the Herbarium of the New England Botanical Club is the object toward which much of the activity of the Club is directed. It is the purpose of the members to illustrate our flora by flowering and fruiting specimens of every species known to occur within New England. It is also desired that each species shall be represented from numerous stations in order that it may be shown under all the varying conditions of exposure, soil, latitude, altitude, and the like, offered by our six states. Especially important is this in these days of close study, when new species are continually being distinguished from those hitherto recognized.

The Herbarium was started in the spring of 1896, and at the date of writing, January, 1899, it contains 10,962 mounted and classified sheets of phanerogams and vascular cryptogams, besides a considerable quantity of bryophytes and thallophytes, as well as phanerogamic *inserendæ* which have not as yet been incorporated in the organized collection. In addition to many contributions from the various members of the Club, the following valued accessions have been received by gift: Many duplicates from the Gray Herbarium, including a considerable part of the collection of the late William Boott; a carefully prepared set of plants from Mr. J. H. Whittemore, illustrating the native flora of his estate in Middlebury, Connecticut; the herbarium of the late Herbert A. Young, including the plants enumerated in his Flora of Oak Island, Massachusetts; the entire herbarium of the Metropolitan Park Commission, representing the flora of the large park-reservations about Boston; the New England plants from the herbarium of the Middlesex Institute, including those illustrating Dame and Collins' Flora of Middlesex County, Massachusetts. The late Edwin Faxon contributed a critically identified set of mosses from the White Mountains and other parts of New England. Mr. F. S. Collins has given about five hundred algæ, mainly marine, while other members of the Club have made contributions in the same group.

The Herbarium of the New England Botanical Club, thus excellently begun, must, as it is further developed, eventually become an important factor in research work upon New England plants, while the

fullness of its representation, may contribute much to the completeness and accuracy of future works upon the local flora of the region.

These being the worthy objects for which the Herbarium is being developed, no hesitation is felt in soliciting the interest and coöperation of botanists in all parts of New England. Well-prepared specimens of plants, both of rare and common species, will be gladly received for the Herbarium and desired information in regard to them given when possible. It is very essential, however, that each specimen should be accompanied by a neat label written in ink and stating the exact place and date of collection, habitat, and collector. It is the policy of the Club to incorporate in its Herbarium no specimens which are accompanied only by vague or imperfect data.

The Herbarium is located in the botanical section of the University Museum, Oxford Street, Cambridge, Mass., a room for the purpose being at present loaned to the Club by Harvard University.

Chrysanthemum segetum, L., at Marion, Massachusetts. — This European plant has been found naturalized at several distant places in North America, such as California, Schenectady, N. Y., and some of the eastern seaports. As far as I know, it has not been seen in New England until last summer, when I found a plant growing by the roadside at Marion, Mass. In appearance it resembles the common species, *C. Leucanthemum,* except that the whole plant is rather lower, with larger leaves, and short, leafy peduncles. The rays are bright yellow, rather broad, and emarginate. The occurrence of this plant at a place like Marion (on Buzzard's Bay) is probably due to another accidental introduction of European seeds, since there is only very indirect communication with any of its other American stations.

J. Melville Hunnewell.

FUNGUS NOTES.

H. Webster.

Tricholoma equestre (L.) Fr. was noticeably abundant in dry woods in eastern Massachusetts last October, and received much attention from fungus-lovers and toadstool-eaters. Unlike many other Tricholomas, it was found even by novices to be rather easily determinable. The plainly viscid pileus, which even in dry weather is apt

to have pine needles or bits of leaves firmly fastened to it, suggests unfailingly the proper section, *Limacina*, and the sulphur yellow gills at once fix the species. As to minor details, although the standard descriptions are more or less at variance, confidence remains practically unshaken, perhaps because one finds this variance allowed for in Peck's notes on the species (vid. Rep. State Botanist of N.Y. for 1890, p. 40).

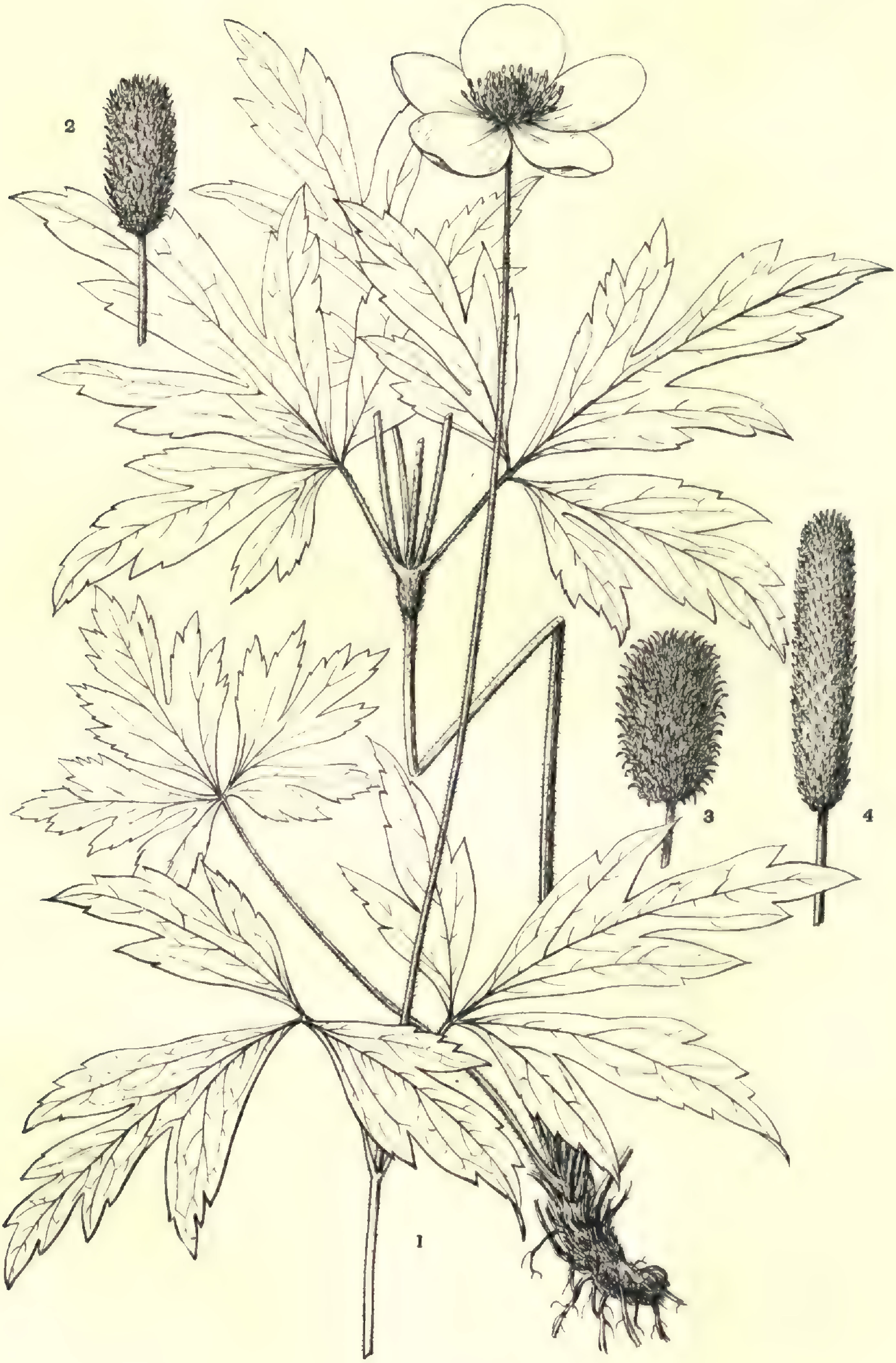
Plants collected on October 27 were not viscid to the touch, in spite of a heavy rain the day before; but the presence of bits of leaves and needles firmly adhering to the caps left no room for doubt. The scales that sometimes appear were hardly apparent. In color the pileus was reddish brown at the disk, passing into pale yellow at the margin. An occasional green tint to the yellow, absent, according to Peck, from specimens seen by him, recalled Fries's remark (Epicrisis, p. 20), that this species and others are often greenish in late autumn. In connection with this point it is worth noting that Fries makes *Agaricus flavovirens* Pers. a synonym. The stem was generally white, as described by Peck, not sulphur yellow as called for by the diagnosis in Fries, though Fries notes the occurrence at Upsala of a white-stemmed form. Short-stemmed specimens, however, showed a yellow tint so pale as to seem like a reflection from the gills. The lamellæ were rounded or emarginate, and nearly free, and appear quite free in a few specimens since drying.

The dimensions given by Peck (pileus 3 to 5 in. broad, stem 1 to 2 in. long) applied well to plants that grew on pine needles, but not to those among loose leaves; in these the stem was much longer, equalling or surpassing the width of the cap. A similar difference in habit is often noticeable in agarics, but was so marked in this case as to cause comment. The longer stems were in some cases flexuous and slightly bulbous. The plants were in groups, but distinct.

Though this species is not recorded as edible by Fries, by Cooke, or by Peck, it may be safely added to the edible list, for it has been tested repeatedly by people known to the writer.

Lactarius luteolus Peck, recorded in Rhodora for January from several stations near Boston, has been found in abundance in chestnut woods in Pomfret, Conn., by Miss S. B. Fay.

Vol. 1, No. 2, including pages 21 to 40, was issued February 1, 1899.



C. E. Faxon del.

Fig. 1–2, Anemone riparia. Fig. 3, A. virginiana. Fig. 4, A. cylindrica

Rhodora

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A LIST OF VERMONT HELVELLEAE, WITH DESCRIPTIVE NOTES.[1]

E. A. Burt.

(Plate 4.)

The Helvelleae are a family of discomycetous fungi with fructifications consisting usually of two portions; an ascigerous, or spore-containing portion and a stem — sometimes called stipe — upon which the ascigerous portion is elevated above the underground, vegetative mycelium. The ascigerous portion (*d*, figs. 3 and 4) is very varied in form, as mitrate, clavate, capitate, ovoid, etc. The reproduction of the Helvelleae is by ascospores, that is by spores contained in the interior of fleshy sacs, called asci. From two to eight spores, according to the species, are contained in an ascus (figs. 1*a*, 4*b*, etc.). The asci, intermixed with sterile, thread-like bodies, called paraphyses (figs. 4*c* and 5*a*) are arranged side by side in a palisade layer, called the hymenium, which forms the outer and upper surface of the ascigerous portion. The hymenial surface is either even, rugose, gyrose-convolute or pitted by intersecting systems of ridges, its configuration affording in some cases characters of generic value.

By their habit and size, some species of the Helvelleae may be confused with Basidiomycetes, such as Phalleae, Sparassis, and the simple club-like forms of Clavaria. Microscopic examination with a one-fifth or one-sixth-inch objective of a small bit of the hymenium, crushed down in a drop of water under a cover glass, will decide all doubtful cases by showing the characteristic asci containing spores for all Helvelleae.

Some species of Xylaria, a genus of pyrenomycetous fungi, have fructifications which somewhat resemble those of Geoglossum, a genus

[1] Read in abstract before the Vermont Botanical Club, January 28, 1899.

of the Helvelleae. The species of Xylaria are more woody when mature, however, and sectional views of their fructifications show the hymenium, lining small sunken pits, the perithecia, each of which opens to the exterior by only a very minute aperture.

The twenty-one species of Helvelleae so far found in Vermont[1] belong in the eight genera: Morchella, Gyromitra, Helvella, Geoglossum, Spathularia, Vibrissea, Mitrula, and Leotia. For the convenience of those who are working toward a better knowledge of our Vermont and New England species and their distribution, a key to these genera is given and also brief descriptive notes on each species. For the same reason, notes are also included on a few additional species not yet found in Vermont. In the treatment of the subfamily Geoglosseae, I have followed Massee's Monograph of the Geoglosseae,[2] which seems to have been very carefully prepared and gives, on the whole, the most satisfactory presentation of the genera and species yet published.

Key to the Genera.

I. Ascigerous portion pileate or mitriform; fructification fleshy, rarely less than 3 cm. high, usually 5 cm. or more and often weighing several ounces . . . . . . Subfamily Morchelleae

1. Ascigerous portion ovoid or conical, with its outer surface deeply pitted by intersecting systems of ridges . . . . *Morchella*
2. Ascigerous portion bullate-inflated, gyrose-convolute and somewhat rounded in our single species . . . . *Gyromitra*
3. Ascigerous portion reflexed, mitriform-lobate or saddle-shaped, even. One doubtful member of this genus has the ascigerous portion cup-shaped at first, becoming plane . . . . *Helvella*

II. Ascigerous portion clavate, spathulate, or capitate; fructifications fleshy or gelatinous, mostly slender, erect, small, and usually less than 5 cm. high; asci opening at the apex by a mere pore for liberation of the spores . . . . . . Subfamily Geoglosseae

1 Of the Helvelleae, in Frost's list in the Amherst Catalogue of Plants growing within thirty miles of Amherst, Mass., five of the seventeen species there listed are not represented in the present list. These five species are *Helvella lacunosa* Afz., *H. Ephippium* Lev., *Vibrissea truncorum* Fr., *Mitrula cucullata* Fr., and *Rhizina undulata* Fr. As the authorities of Brattleboro', who have control of the Frost Herbarium, have not yet arranged it so that botanists are permitted to consult it, I greatly regret my inability to include in our Vermont list collections of the above five and any other species of Helvelleae which Frost may have made in Vermont in the vicinity of Brattleboro'.

2 Annals of Botany **11**: 225–306, pls. 12 and 13. 1897.

a. Spores elongated, arranged side by side in a bundle in the ascus. . . 4–6.

4. Fructifications clavate, black; spores brown, septate . . . *Geoglossum*
5. Ascigerous portion obovate, laterally compressed, decurrent down opposite sides of the stem; spores colorless . . . . *Spathularia*
6. Ascigerous portion pileate, free margin incurved towards the stem; spores colorless . . . . *Vibrissea*

aa. Spores narrowly ellipsoidal, 1–2-seriate in the ascus . . . . . *7 and* 8

7. Ascigerous portion subcapitate or clavate, decurrent down the stem *Mitrula*
8. Ascigerous portion capitate or somewhat discoid, imperfectly hollow, margin thick and incurved towards the stem; fructification more or less gelatinous . . . . *Leotia*

MORCHELLA.

1. MORCHELLA ESCULENTA (L.) Pers. Ascigerous portion ovoid, rather obtuse; intersecting systems of ribs often oblique, forming pits rather more round than in the following species; spores 8 to an ascus, 22–24 x 12–14 μ.

In sandy sheep pastures, Burlington (*L. R. Jones*), May 30.

2. MORCHELLA CONICA Pers. Ascigerous portion cylindric-conical; primary ribs longitudinal, secondary ribs transverse, smaller, more like folds; pits narrow and more longitudinally elongated than in *M. esculenta;* spores 8 to an ascus, 16–20 x 9–12 μ. (Figs. 1–1*b*.)

In thin grass under spruce trees, college campus, on lawn, and in mixed woods under oak tree, Middlebury (*Burt*). Five collections, all on clay soil, May 3–28.

3. MORCHELLA ANGUSTICEPS Pk. This is separated from *M. conica* by its generally smaller size, more pointed ascigerous portion, comparatively thicker stem, and larger spores, which are 20–25 x 13–17 μ (Peck), or 27–32 x 16–20 μ (Boudier for this species in France).

A single plant collected at Williamstown, Vt., by L. B. Roberts, was sent to Professor Jones. Half of the specimen was sent to Peck and by him referred to *M. angusticeps* Pk.; the other half is in the Herbarium of University of Vermont.

MORCHELLA HYBRIDA Pers. (= *M. semilibera* DC.) differs from each of the above species in having the lower half of its ascigerous portion free from the stem. As it is reported from Massachusetts, New York, and Ontario, it may yet be found in Vermont.

GYROMITRA.

4. GYROMITRA ESCULENTA Pers. Ascigerous portion rounded, gyrose-convolute, bay-red; spores 20–26 x 10–12 μ. (Fig. 2.)

On sandy ground, Burlington (*Jones*), April 29.

GYROMITRA GIGAS (Batsch.) Fr. and G. SPHAEROSPORA Pk., which have been found in New York, have the ascigerous portion whitish or ochraceous; and the latter has spherical spores, 8–10 μ diam.

HELVELLA.

5. HELVELLA INFULA Schaeff. Stem stout, nearly even, pallid; ascigerous portion lobed, deflexed, subcinnamon, somewhat wrinkled at the

center in my specimens, margin adhering closely to the stem; spores 18–20 x 10 μ. The largest specimen in dried state measures 12 cm. high and ascigerous portion 8 cm. broad.

On rotten pine logs by wood roads and on ground in wood roads, Grand View Mt., and mountains near E. Middlebury (*Burt*), August 6 and 26.

The specimens agree closely with the description and with Schaeffer's tab. 159. The species is rather intermediate between Gyromitra and Helvella, and is sometimes included in the one genus and sometimes in the other. According to Underwood,[1] this species has been found in this country heretofore only in North Carolina and New York.

6. Helvella crispa (Scop.) Fr. Stem deeply and interruptedly sulcate; ascigerous portion deflexed, lobed, often free, crisped, white or whitish; spores 18 x 10 μ. The fructifications are stated to attain a height of 5–15 cm.; my specimens have been small, about 5 cm. high.

In oak woods and by roadside, Lake Dunmore (*Burt*), September 9 and 14.

7. Helvella sulcata Afz. Stem sulcate, with deep longitudinal furrows and thin ribs, somewhat lacunose; ascigerous portion nearly black in my specimens, lobed, deflexed, adherent to stem along under surface; spores 16 x 12 μ.

Under side of rotten log in woods, Lake Dunmore (*Burt*), August 31.

My specimens were barely 4 cm. high and on the whole, agree better with *H. sulcata*, if this is to be regarded as a distinct species and not a small form of *H. lacunosa* Afz.

8. Helvella elastica Bull. Stem slender, even, cylindrical, sometimes compressed with age, 9 cm. long, about 5 mm. thick, white, pruinose; ascigerous portion bilobed, saddle-shaped, decurved at the sides but free from the stem, umbrino-castaneus of Saccardo's Chromotaxia, on upper surface, white and finely rugose on under side, 4 cm. long, 2 cm. high; spores 18–22 x 11–12 μ. (Fig. 3.)

Lake Dunmore (*Farlow*); in wet moss in wood, Lost Pleiad Pond (*Burt*), August 31.

As indicated by the above notes, our specimens are the form with dark upper surface to ascigerous portion and with white under surface and stem, figured under the name of *Elvella fuliginosa* in Schaeffer's Icones, tab. 320. The other common European form with upper surface of the ascigerous portion yellowish has not yet been found in Vermont.

8*a*. H. elastica var. fusca Bull. Champ., pl. 242, fig. D. This differs from the forms above in having the under surface of the ascigerous portion and the stem fuscous (ater of Chromotaxia); spores 18 x 10–11 μ.

On ground in mixed woods, Lake Dunmore (*Burt*), August.

1 On the Distribution of N. Amer. Helvellales. Minn. Bot. Studies, Bull. **9**: 483.

9. Helvella macropus (Pers.) Karst. Stem rough, nearly hairy, cinereous, attenuated upwards, even or irregularly lacunose; ascigerous portion cup-shaped at first, then expanded and rarely slightly elevated at the center, under surface hirto-verrucose and cinereous, upper surface even, mouse-brown; spores colorless, 18–20 x 11–12 μ.

Rather common. On moist ground in mixed woods, Sudbury and Middlebury (*Burt*), August 2 and 14.

This species is somewhat intermediate between Helvella and the Pezizeae but on the ground of its development is generally classed with the latter as *Macropodia macropus* (Pers.) Fk. If one makes first acquaintance of the species with only a fully mature fructification, having the center slightly elevated, he may try to place it as an Helvella or a Verpa.

Helvella Ephippium Lev. is a small species rarely more than 2½ cm. high. It somewhat resembles *H. elastica* in a young state but has the stem and under side of the ascigerous portion villose. It has been reported from Massachusetts and Rhode Island.

Geoglossum.

10. Geoglossum hirsutum Pers. form G. Farlowi Cke. Fructifications black, clavate, densely velvety, 4–7½ cm. high; with brown setae in the hymenium equaling or but slightly exceeding the asci; spores pale brown, slightly curved, 3–5-septate but most frequently 3-septate; 72–85 x 5½ μ. (Figs 4–4 *c*).

On ground in mixed woods, Grand View Mt. (*Burt*), August 26.

Determination as *G. Farlowi* Cke. confirmed by Dr. Farlow. Specimens from this collection were distributed in Ellis & Ev. N. A. Fungi, No. 3532.

Other forms of *G. hirsutum*, most readily distinguished by their spores being more than 5-septate, have been found in New York and Massachusetts and are to be looked for here.

11. Geoglossum glabrum Pers. Fructifications black, clavate, about 5 cm. high, with stem minutely squamulose, so as to appear almost hairy; no brown setae in the hymenium; spores brown, narrowly clavate, 7-septate, 85–95 x 6–8 μ; paraphyses with tips curved or sometimes straight. — *G. ophioglossoides* (L.) Sacc.; *G. simile* Pk.

On swampy ground, Abby Pond; on ground in woods, S. Lincoln Notch; on very rotten log in hemlock grove, Lake Dunmore (*Burt*). August 28, September 2 and 14.

12. Geoglossum Peckianum Cke. Fructifications black, glabrous, narrowly lanceolate, 3–6 cm. high; stem viscid; no brown setæ in the hymenium; spores brown, 15-septate, 120 x 7 μ; paraphyses with brownish spirally curved and twisted tips. (Figs. 5–5*b*).

On ground in mixed woods, Grand View Mt. (*Burt*), August 26.

Determination confirmed by Mr. Peck.

Spathularia.

13. Spathularia clavata (Schaeff.) Sacc. Fructifications 3–6 cm. high, compressed, obovate; ascigerous portion bright yellow, obtuse or cleft at the apex, decurrent down opposite sides of the stem, margin crisped: stem white or whitish, glabrous; spores finally multiseptate, 50–65 x 2½–3 μ. — *S. flavida* Pers. (Fig. 7.)

Very common, usually in pine woods. Newfane (*C. D. Howe*); Ripton and Middlebury (*Burt*), August 21, 28, and September 9.

Specimens from the Middlebury collection were distributed in Fungi Columbiani, No. 1213.

Spathularia rugosa Pk. Rep. N. Y. Mus. **50**: 118, has been recently separated from *S. clavata* on account of rugose stem and shorter spores 40–60 x 2 μ; its form and coloration are the same.

14. Spathularia velutipes Cke. & Farlow. Form and size as in *S. clavata*, but ascigerous portion is tawny yellow and stem minutely velvety, dark brown; spores 55–60 x 1½ μ. (Fig. 6.)

On mossy trunks in damp woods, Lake Willoughby (*Farlow*); on mossy log, Lake Dunmore, and on ground in spruce and pine woods, Abby Pond and Middlebury (*Burt*). August 17, 28 and September 20.

Vibrissea.

15. Vibrissea circinans (Pers.) Hazsl. Fructifications gregarious, 2–4 cm. high; ascigerous portion pileate, pale yellowish flesh-color or yellowish, under surface concave, minutely wrinkled, the ridges running down the apex of the stem; stem pallid or reddish, pulverulent, glabrous; spores finally multiseptate, 50–60 x 2 μ. (Figs. 8–8*c*.) — *Leotia circinans* Pers.; *Cudonia circinans* (Pers). Fr.

Burlington (*L. R. Jones*); on ground in pine woods, Middlebury (*Burt*). September 20.

Specimens from the Middlebury collection were distributed in Ellis & Ev. N. A. Fungi, No. 3533.

16. Vibrissea lutea Pk. Fructifications gregarious, 1½–2½ cm. high, yellow; ascigerous portion subglobose, with margin slightly lobed, inflexed; stem nearly equal, solid, glabrous, a little more highly colored than the ascigerous portion, longitudinally wrinkled when dry; spores 72 x 2½μ (80–90 x 2½μ Massee); paraphyses with spirally curved tips in my specimens.

On rotting beech leaves in moist wooded ravine, S. Lincoln Notch (*Burt*), September 2.

Our specimens have been seen by Mr. Peck and the determination authenticated.

Vibrissea truncorum Fr. has been found in New York, Massachusetts, and New Hampshire and probably occurs in Vermont. It is an aquatic fungus, growing on submerged, decaying wood, branches and leaves, and attaining its best development in mountain streams. It is 1–2 cm. high; ascigerous portion deep orange-red; stem minutely velvety or squamulose; spores 200 x 1 μ.

MITRULA.

17. MITRULA OLIVACEA (Pers.) Sacc. Fructifications gregarious or cæspitose, 2–4½ cm. high, hollow, very irregularly compressed, slimy or greasy to the touch but not viscid; ascigerous portion tawny-olivaceous, or greenish umbrinus, glabrous; stem paler than the ascigerous portion and more olivaceous, glabrous, shining; spores slightly curved, usually 4–5-guttulate and simple, but in an old specimen just beginning to decay rarely 3-septate, 15 x 5 μ. (Figs. 11–11*b*.) *Geoglossum olivaceum* Pers.; *Leptoglossum olivaceum* (Pers.) Cke.

In wood road, Grand View Mt. (*Burt*). August 26.

The spore dimensions agree with those given by Rehm in Rabenhorst's Pilze and by Massee, but are smaller than stated in Phillips' Discomycetes or in Saccardo's Sylloge (25 x 8 μ). Through the kindness of Dr. Farlow I have been permitted to compare our specimens with European specimens of the closely related species *Mitrula viridis* and *M. olivacea*, distributed as *Leotia viridis* (Pers.) in Kunze's Fun. sel. No. 196 and *Leptoglossum olivaceum* (Pers.) in Phillips' Elv. Brit. No. 5. Our specimens are referred to *M. olivacea* on account of the glabrous stem. I am not aware that this species has been found heretofore in N. America; *M. viridis*, which has the stem minutely squamulose or granulose, is reported for S. Carolina and Pennsylvania.

18. MITRULA LARICINA (Villars) Massee. Fructifications gregarious, 2–6 cm. high; ascigerous portion broadly ovoid or subglobose, often more or less compressed, egg-yellow to orange-red, hollow; stem white or with a tinge of pink or yellow; spores 14–20 x 3 μ. *Mitrula phalloides* (Bull.) Chev.; *Mitrula paludosa* Fr.

On leaves in drying pools, Abby Pond, Ripton (*Burt*). June 26.

19. MITRULA VITELLINA (Bres.) var. IRREGULARIS Pk. Fructifications 2½–5 cm. high; ascigerous portion clavate, often irregular or compressed and somewhat lobed, tapering below into the short, rather distinct, yellowish or whitish stem; spores uniseriate, 10 x 5 μ.

In path on the western ascent of Mt. Mansfield (*L. R. Jones* & *Burt*). September 8.

Specimen seen by Mr. Peck and determination authenticated.

20. MITRULA RUFA (Schw.) Massee. Fructifications gregarious or scattered, 3–5 cm. high, varying in color from rufous or dusky brownish olive to dingy yellow; ascigerous portion narrowly ellipsoidal or clavate, often more or less laterally compressed and longitudinally rugulose, glabrous, 1–2 cm. long, 4–7 mm. broad, not sharply differentiated from the thinner, and usually paler, minutely squamulose stem; spores 8, irregularly 2-seriate, hyaline, slightly curved, 25–35 x 5–6 μ, at first multiguttulate, finally 5-septate, paraphyses with tips slightly thickened and more or less curved. *Geoglossum rufum* Schw.; *Mitrula lutea* Mont.; *Geoglossum luteum* Pk.; *Mitrula lutescens* B. & C.; and *Geoglossum pistillaris* B. & Cke. are given as synonyms by Massee, the types

to which they refer — all from America — being too closely intergraded for specific separation.

Two extreme forms of this series occur in Vermont, but with such close agreement in their spores and paraphyses as to favor Massee's conclusion. These forms are: —

a. Geoglossum rufum Schw. of Schweinitz's Syn. Fung. Amer. Bor. n. 1011. Fructification glabrous, rufous, subrugose, more than 2½ cm. high; ascigerous portion broadly clavate, obtuse at the apex; spores 28–36 x 5 μ; paraphyses with the tips strongly curved. (Figs. 9 and 9*a*.)

Amongst sphagnum, Lake Dunmore (*Farlow*), September.

This specimen was determined by Dr. Farlow as *G. rufum* Schw.

b. Geoglossum luteum Pk. of Rep. N. Y. Mus. **24**: 94. Fructifications more dingy yellow in color; ascigerous portion usually narrower; stem minutely squamulose; spores 26–36 x 5 μ; paraphyses less strongly curved. (Fig. 10.) Immature specimens agree with the description and figures of *Mitrula lutescens* B. & C.

Very common. On mossy banks and on humus of wood in woods, Belden's Falls, South Lincoln Notch, Lake Dunmore (*Burt*). July 20, September 2, 9 and 14.

A Lake Dunmore collection has been seen by Mr. Peck and the determination as *Leptoglossum luteum* (Pk.) authenticated.

Mitrula cucullata Fr. has been collected in New York and Massachusetts and is to be looked for in Vermont. The fructifications grow on the fallen leaves of pine and various conifers and are from 1–2 cm. high; ascigerous portion irregularly obovoid, orange-yellow or orange-brown; stem very slender, usually crooked, glabrous, brown; spores 12–18 x 3 μ.

Leotia.

21. Leotia lubrica Pers. Fructifications gregarious or in small clusters, somewhat gelatinous, 4–8 cm. long; ascigerous portion yellowish green to dark-green; stem not squamulose; spores finally 5-septate, 20–24 x 5–6 μ. (Fig. 12.)

Common on damp ground in woods, Lake Hortonia, Abby Pond, South Lincoln Notch (*Burt*), August 15, 28, September 2.

Spragueola Americana Massee has been founded on a single New England collection by Sprague and should be especially looked for. The genus belongs in the section with Mitrula but differs from Mitrula in having the ascigerous portion strictly sessile. The fructification is subglobose in form, 1½–2½ cm. diam., coarsely nodulose, glabrous, pale ochraceous tan; spores obliquely uniseriate, continuous, 6½–7 x 3½ μ. *Mitrula crispata* Fr. in Berk. Notices N. A. Fungi No. 704.* Grev. **3**: 149.

Middlebury College, Middlebury, Vt.

Explanation of Plate 4. — Fig. 1, *Morchella conica* (copied from Cooke's Mycographia), x ⅔; fig. 1*a*, ascus containing 8 spores, x 200; fig. 1*b*, 2 spores, i.e. ascospores, x 333. Fig. 2, *Gyromitra esculenta* (copied from Gillet's Discomycetes), x ⅔. Fig. 3, *Helvella esculenta*: *d*, its ascigerous portion; *e*, its stem, x ⅔. Fig. 4, *Geoglossum Farlowi*; *d*, its ascigerous portion; *e*, its stem, x ⅔; fig. 4*a*, seta from hymenium, x 200; fig. 4*b*, ascus containing 8 spores, x 200; fig. 4*c*, 3 paraphyses, x 200. Fig. 5, *Geoglossum Peckianum*, x ⅔; fig. 5*a*, 2 of its paraphyses, x 200; fig. 5*b*, a spore,

x 200. Fig. 6, *Spathularia velutipes*, x ⅔. Fig. 7, *Spathularia clavata*, x ⅔. Fig. 8, *Vibrissea circinans*, x ⅔; fig. 8*a*, median longitudinal section of same; fig. 8*b*, ascus, x 200; fig. 8*c*, spore, x 333. Fig. 9. *Mitrula rufa* form *Geoglossum rufum* Schw., x ⅔; fig. 9*a*. ascus and paraphyses of same. Fig. 10, *Mitrula rufa* form *Geoglossum luteum* Pk., x ⅔. Fig. 11, *Mitrula olivacea*, x ⅔; fig. 11*a*, ascus and paraphyses, x 333; fig. 11*b*, 3 of its spores, x 333. Fig. 12, *Leotia lubrica*, x ⅔.

SOME NOTEWORTHY PLANTS OF SOUTHEASTERN CONNECTICUT.

C. B. Graves.

The following notes are offered as a contribution to our knowledge of geographical distribution. Many of the species named have not yet obtained recognition as New Englanders.

Equisetum palustre L. — A northern plant not hitherto reported, so far as I am aware, south of northern Maine and the Vermont shore of Lake Champlain. It was found by me in the summers of 1897 and 1898, growing in fair abundance in the wet meadows bordering Selden's Cove, on the Connecticut River, in the town of Lyme, about ten or twelve miles from the shore of Long Island Sound.

Panicum longifolium Torr. — In going over my Panicums a year or two ago, I came across several specimens of this species collected in Montville in September, 1882. I have not met with it since. I believe it has not been recorded north of New Jersey.

Panicum barbulatum Michx. — Is abundant throughout this part of the state, growing along streams and in wet meadows.

Oryzopsis juncea (Michx.) B. S. P. (*O. canadensis* Torr.) — Occurs sparingly in pine woods near the shore of the Thames River, twelve miles from its mouth, in the town of Preston, which is south of its range as usually given.

Agrostis intermedia Scribner. — In Britton and Brown's Illustrated Flora the distribution accorded this species is "New York to Tennessee and Missouri." It is a common grass in this vicinity in dry woodlands.

Sieglingia seslerioides (Michx.) Scribner (*Triodia cuprea* Jacq.). Another species not recorded, I believe, from New England except in the appendix to Gray's manual, 6th ed., and in Bishop's Catalogue of Connecticut Plants. It was found by the writer in 1887 at Crescent

Beach in East Lyme, and has since then been met with in several other towns of the county. It is not, however, common.

Eatonia nitida (Spreng.) Nash (*E. Dudleyi* Vasey). — Discovered by the writer in 1890 in Lyme, as reported in Bull. Torr. Bot. Club xviii, 5, 153. It has proved to be not rare in rocky woodlands throughout the county. It is not, I believe, recognized as a New England plant except in Scribner's American Grasses, where its northeastern range begins at Rhode Island.

Bromus hordeaceus L. Has been collected in New London at various times since 1889, though New York is the northern and eastern limit given in the manuals.

Carex styloflexa Buckley (*C. laxiflora styloflexa* Boott). — This species also should have a place in the New England flora, though its recorded distribution in Britton & Brown's Illustrated Flora limits it to southern New York and Pennsylvania. I have a few specimens from Selden's Neck in Lyme collected in 1890.

Lemna perpusilla Torr. — Occurs frequently in this region, being found as a rule in running water, growing in the form of densely tangled skeins or mats and usually quite submerged. The identification rests upon the authority of the late Dr. Thomas Morong to whom I sent sterile material in 1892. I have never found flower or fruit. "New York and New Jersey" is the range commonly assigned this species.

Juncus acuminatus debilis (A. Gray) Engelm. — Has been found by the writer at two points in this county, one in Ledyard, the other in Waterford. It has also been reported from Maine by Mr. Parlin as noted in appendix to Gray's Manual 6th ed., which is the only other New England record known to me.

Muscari racemosum Mill. — In New London has escaped into lawns where has been well established for years. So far as I know it is not yet recognized as a member of the New England flora.

Gyrotheca capitata (Walt.) Morong (*Lachnanthes tinctoria* Ell.). — The occurrence of the "paint-root" on the shores of Pataguanset Lake in East Lyme, where it was discovered by the writer in 1897, furnishes another interesting instance of a connecting link between the northern and more southerly stations of a rare and local plant.

Geum flavum (Porter) Bicknell. — Not rare in this vicinity. New York is the northeastern limit given in the Illustrated Flora.

Prunus Mahaleb L. — Has become well established over a certain hillside in New London, and has been met with also in Groton and Preston. This species also has not I think been reported from New England.

Lechea Leggettii Britt. & Holl. — Abundant in this section of Connecticut, but not to my knowledge recorded north of Long Island, N. Y.

Lycopus sessilifolius A. Gray. Occurs sparingly on the shore of Long Pond in Ledyard, where I found it first in 1895. This station, which so far as I know is the only one known in Connecticut, is of interest as a connecting link between the Cape Cod and Long Island stations.

Mentha longifolia (L.) Huds. Grows freely by the roadside at one point in Ledyard.

Mentha crispa L. — Escaped to the roadside near farmhouses at points in Ledyard, Voluntown and North Stonington. This and the preceding species have thus far, according to the ranges given in the manuals, been found growing wild only from New York or New Jersey southward.

Galium palustre L. — Discovered this past season at two stations in Waterford. Apparently not found hitherto south of Massachusetts.

Aster Herveyi A. Gray. Connecticut should be added to the short list of states in which grow this rare aster. It occurs sparingly at one point in the town of Groton.

A SEAWEED COLONY.

F. S. Collins.

The coast of Maine in the region of Penobscot Bay is seldom exposed to the open sea, but is guarded by a thick fringe of islands, large and small, so that in most places no direct view of the open sea can be had. The passages among the islands, the thoroughfares and reaches, give quiet, sheltered sailing, even when there is a heavy sea outside. Naturally, the difference in conditions is shown in the character of the marine flora, the exposed outer islands being fringed with a dense growth of *Alaria esculenta*, species of Laminaria, and other less conspicuous plants that are adapted to live in the heavy surf and do not occur on the shores of the mainland.

The same distinction may be seen in smaller compass on a single island, even quite a small one, the exposed side having quite a different flora from the sheltered inner side.

North of Camden, the whole of Penobscot Bay may be considered as landlocked, and only the algae adapted to quiet waters are to be found. It is to call attention to an interesting exception to this rule that this note is written. The harbor of Castine is on the east side of the bay; and on the south side of the harbor, near the cluster of houses known as Harborside, is the outlet of Goose Creek. Originally little more than a brook it is now a pond, narrow, but nearly a mile long, the outlet having been dammed, so that for an hour or two at high water, the tide runs in swiftly; for the rest of the twelve-hour interval between tides, the water runs out over the dam; at low water there is a fall of about fifteen feet.

The place is very picturesque; wooded hills rise sharply on all sides except to the west, where they open out to give a view of the broad bay, and of the historic harbor for whose possession four naval battles have been fought. An old square colonial mansion, with the garden of phlox, hollyhocks and red yarrow is on one side of the fall, the ruined buildings of a deserted silver mine on the other, and an equally ruined sawmill stands on a rock in the middle.

But however beautiful the scenery, it would not be entitled to mention in Rhodora, were it not for the algae that grow here. In the pond itself, the temperature in summer is much above that of the bay, and as a result of this we have a luxuriant growth of lagoon plants, more like what is found in similar places in southern Massachusetts, or on the shores of Long Island Sound. *Ceramium strictum* and *Polysiphonia Olneyi* grow abundantly on the mud bottom, just below the surface of the water; *Mesogloia divaricata* and *Chaetomorpha Linum* form floating masses of great extent, as do many of the Cyanophyceae.

In striking contrast with this are the algae covering the slopes and filling the pools of the outlet. Here we find, only a few feet from the warm water plants just mentioned, the characteristic flora of the most exposed outer islands. There is a dense growth of *Laminaria saccharina* and some *Alaria esculenta,* each with the usual epiphytes, Ectocarpus species, etc. *Leathesia difformis* and *Chaetomorpha Melagonium* are plentiful in the pools, and in the swift raceways of the current are dense masses of deep green *Bryopsis plumosa* and dull red *Gloiosiphonia capillaris.* The whole combination would be quite at home on an ex-

posed promontory like Nahant, or an island like Monhegan, but seems singularly out of place in a landlocked bay. No similar colony has been found within many miles, and we must conclude that the rush and fall of the water over the rocks gives conditions so like those of the surf-beaten shores, that the plants whose home is in the latter, find themselves quite comfortable in the former.

As the conditions are largely artificial, it is probable that the colony is of comparatively recent origin, but there is no difficulty in supposing that spores are continually carried up and down by the tide, only the lack of suitable conditions preventing their obtaining a foothold in other localities.

SOME ANTENNARIAS OF NORTHERN NEW ENGLAND.

M. L. Fernald.

The synopsis of The Genus Antennaria in New England [1] published by me some months ago might more appropriately have been called "The Genus Antennaria in Central and Southern New England," for, at that time, little was known of the species in the extreme northern portions of these states. During the past June and July, however, collections were made by Dr. George G. Kennedy, Mr. Emile F. Williams, and others about Willoughby, Vermont, and in the White Mountains; and in June by the author in central and northern Maine. The observations then made show that in a large portion of Maine, New Hampshire, and Vermont, the genus *Antennaria* is represented largely by species uncommon or wanting in southern New England; and, furthermore, that the species commonest about Boston and Providence are rare or quite unknown in our more northern sections.

The range of *Antennaria Parlinii* has been extended slightly north of its formerly recorded limit. This plant was found in June in the Piscataquis valley (Maine), by a woodland stream in Foxcroft; and the large-leaved var. *ambigens* was collected on the gravelly wooded esker by the Penobscot in Orono.

Antennaria neglecta, the commonest species in southern New England, is rare in central Maine, and, though detected at various stations, even to the extreme northern boundary of the state, it is certainly an unusual plant north of Bangor.

1 Proc. Bost. Soc. Nat. Hist. xxviii. 237–249.

Antennaria canadensis, which is rare south of Boston, is, with the possible exception of *A. neodioica*, the commonest species of northern New England, passing occasionally into the larger-headed and more attractive var. *Randii*.

The northern Antennarias of greatest interest, however, are certain forms characteristic of the regions where they grow, but either misinterpreted or quite unknown until the past summer. A large suite of specimens secured at various points along the line of the Bangor and Aroostook railroad show conclusively that the Mount Desert plant, formerly treated by me as a variety of *A. neglecta*, the Maine specimens then called *A. campestris*, and the northern New England forms called by me *A. neodioica*, var. *petaloidea*, are in reality extreme forms of the same species. This plant was seen in great abundance in June throughout Aroostook County and at more southern stations in Piscataquis and Penobscot counties, where it is far more abundant, in fields and on grassy slopes, than the related *A. neglecta*. Specimens have been referred to Dr. Rydberg who pronounces them very different from his western *A. campestris*. When the Maine plant was provisionally referred to that species it was known only from autumnal leaf-specimens; but now, with abundant flowering material at hand, there is no need of further confusion between them. *A. campestris*, confined for the most part to the prairies west of the Mississippi, is a very low plant, rarely becoming 1 dm. high; on the other hand, the northeastern plant is often more than 4 dm. high. Low early forms of what is apparently immature *A. neglecta* closely simulate the western *A. campestris*, but such plants have been carefully observed by Mr. J. C. Parlin, who finds that they later develop the characteristic racemose inflorescence of the eastern *A. neglecta*.

From *Antennaria neglecta*, with which the plant was formerly placed, field-observations show this northern plant to be very distinct. In June, when this species was in flower, its *corymbose* heads gave to the fields a *tawny* or *brownish-white* color; while, in neighboring colonies, the old and often over-ripe *racemes* of *A. neglecta* formed patches of *purplish-white* or sometimes almost *crimson*. This color-character alone may not prove of absolute constancy; but the corymbose inflorescence and much later flowering season, as well as its greater abundance in northern New England where the early *A. neglecta* is a comparatively rare plant, distinguish it very clearly from that species.

From *A. neodioica*, with which poorly developed specimens of this

plant were associated, it is quickly distinguished by its slender procumbent stolons which are generally elongated as in *A. neglecta* (though sometimes scarcely developed at the flowering season), and its more cuneate or spatulate, hardly obovate, leaves.

The plant should take as its specific designation the name first applied to it as a variety : —

Antennaria petaloidea. Stems slender, 2 to 4.5 dm. high, very floccose-pubescent; stolons as in *A. neglecta*, slender, prostrate, generally elongated, bracteate throughout except at the leafy tip : basal leaves from spatulate to cuneate-obovate, scarcely with distinct petioles, at first appressed-silky or somewhat arachnoid above, finally glabrate, or often with a more or less permanent narrow white-pubescent border ; stem-leaves small, linear-lanceolate, remote : heads corymbose, with the lower pedicels sometimes much elongated : involucre of the pistillate plant 8 to 10 mm. high ; bracts linear or linear-lanceolate, brown or green and brown below, the blunt outer ones lanate at base, the inner narrower, longer and acute, all with white petaloid tips, or sometimes with the brown chartaceous portion extending upward to the tip : staminate plant unknown. — *A. neodioica*, Greene, var. *petaloidea*, Fernald, Proc. Bost. Soc. Nat. Hist. xxviii. 245. *A. neglecta*, Greene, var. *subcorymbosa*, Fernald, l. c. 246. *A. campestris*, Fernald, l. c. 247, not Rydberg. In fields and on grassy banks, or rarely in open woods, northern New England, flowering in June and early July. The following specimens are referred here — Maine : Fort Kent, June 15, 1898, no. 2384 ; Ashland, June 13, 1898, no. 2386 ; Blaine, June 23, 1898, no. 2385 ; Houlton, August, 1897 ; Island Falls, June 10, 1898, nos. 2387, 2388 ; Foxcroft, June 6, 1898, nos. 2389, 2390, 2391 ; Milo, September, 1897 ; Orono, June 4, 1898, no. 2392 (*M. L. Fernald*) ; Seal Harbor, Mount Desert Island, July 9, 1897 (*E. L. Rand*) ; Farmington, June, 1897 (*C. H. Knowlton*) ; New Hampshire : Forest Hill, Echo Hill, Butter Hill, etc., Franconia, June 5 to 15, 1897 (*Edwin Faxon*) ; Jaffrey, May 31, 1897 (*E. L. Rand* & *B. L. Robinson*, nos. 427, 428) ; Vermont : Willoughby, June 9, 1898 (*G. G. Kennedy* & *E. F. Williams*).

Var. **scariosa.** Involucral bracts narrow, long-attenuate, scarious and lucid ; the outer sometimes broader and becoming petaloid. — With the species and passing to it ; forming extensive carpets on dry open hillsides or on pasture-knolls, Orono, Maine, collected by the author, June 3, 1898, nos. 2395, 2365 ; and on a dry sandy bank, Foxcroft, June 6, 1898, no. 2394.

A handsome large form of *A. neodioica*, first collected by Mr. Rand on Mount Desert Island, and subsequently by Dr. Kennedy at Willoughby, is so striking as to merit distinction as

A. NEODIOICA, Greene, var. **grandis.** Plants large, 3 to 5 dm. high ; leaves and stolons as in the species, but rather larger ; the basal leaves,

when well developed, 4 or 5 cm. long; the cauline oblanceolate to oblong-lanceolate, mostly large, 3 or 4 cm. long, 5 to 8 mm. wide (in occasional specimens as small as in the species): heads large and full, as broad as high: involucre 6 to 8 mm. high, the bracts purple, brown, or green below, with whitish petaloid or hardly scarious tips; the outer blunt or acute, the inner attenuate. — Somesville, Mount Desert Island, July 1 and 2, 1897 (*E. L. Rand*); Long Pond road, Willoughby, Vermont, July 11, 1898 (*G. G. Kennedy*).

A unique species with lemon-tinged heads is characteristic of the river-cliffs and ledges along the Mattawamkeag river in southern Aroostook county, Maine. This plant, from its usual habitat, may be called:

A. rupicola. Stems slender, 1.5 to 3 dm. high, invested with loose flocculent pubescence; stolons very numerous, short and assurgent, leafy throughout: basal leaves from oblanceolate to narrowly obovate-spatulate, mucronate, 1 to 4 cm. long, beneath densely white-tomentose, above gray with loose and somewhat arachnoid hairs, with age sometimes becoming glabrate; cauline leaves lanceolate, mucronate, dark green, arachnoid-pubescent beneath, slightly arachnoid or glabrate above, those midway up the stem 2 or 3 cm. long: heads rather compactly clustered; the pedicels generally shorter than the heads: involucre of pistillate plant 8 to 10 mm. high; bracts in 4 or 5 series, with conspicuous yellowish-white firm papery tips much exceeding the dark bases; the short outer obtuse erose ones oblong with dark green and brownish slightly arachnoid or glabrate bases; the innermost longer ones lance-linear, acute: staminate plant unknown. — Abundant in crevices of calcareous-slate ledges and on rocky banks along the Mattawamkeag River, Island Falls, Maine; the type material collected by the author June 9, 1898, no. 2361. A very attractive species, in habit somewhat resembling *A. neodioica.* The leaves, however, are much narrower than in that species, and scarcely if at all differentiated into blade and petiole. The firmer yellowish-white bracts of the involucre, in texture resembling those of *Gnaphalium decurrens*, are quite unlike the bracts of any other known eastern species.

A. FALLAX, Greene, Pittonia, iii. 321, is a very puzzling plant. In its bright-green basal leaves and its large heads and inflorescence it strongly resembles *A. Parlinii;* but the plant is quite glandless, the young basal leaves are generally slightly arachnoid above, and the cauline leaves are reduced as in *A. plantaginea.* The bracts of the involucre resembling those of *A. Parlinii*, but with the outer generally broader and more petaloid, are either purple or greenish. This plant, in its characters somewhat intermediate between *A. Parlinii* and *A. plantaginea*, though nearer the former, is much more abundant in central Maine than either of those species. The following New England specimens have been examined: Sandy field, Milo Junction,

Maine, June 6, 1898 (*M. L. Fernald*, no. 2344); gravelly bank, Orono, Maine, June 4, 1898 (*M. L. Fernald*, nos. 2342, 2345); hillsides, Jaffrey, New Hampshire, May 31, 1897 (*E. L. Rand* & *B. L. Robinson*, no. 424); Willoughby, Vermont, June 10, 1898 (*G. G. Kennedy* & *E. F. Williams*).

NOTEWORTHY PLANTS AT EXETER, MAINE.

L. H. Baker.

A collection made at Exeter, Maine, during the summer of 1898, by Miss Florence Grey, contains the following plants of interest, introducing one species from Europe, extending the range of two others and confirming an old report of a fourth.

Centaurea scabiosa L., which seems to be newly introduced from the Old World, is quite distinct in its general appearance from the species more commonly met with in New England, — *C. Cyanus*, *C. nigra* and *C. Jacea* — the involucre being more globose, the coloring of the scales confined to the extreme tips and upper margins and the leaves deeply pinnatifid. A more detailed description of the species follows: —

Stem 2°–3°, simple or sparingly branched, striate, scurfy or somewhat pubescent. Leaves deeply pinnatifid, bearing scattered hairs beneath. Heads 1½′ to 2′ broad, solitary at the end of the stem or branches. Involucre globose, blade of the bracts lanceolate or ovate, only the extreme margins and tips colored dark brown or black. Fimbriation present on all the bracts, hardly equal to the width of the blade. Flowers purple, the outer enlarged and ray-like. Achenes pubescent. Pappus of copious, unequal bristles, longer than the achene.

Coronilla varia L., which has previously been reported in Maine only at Bucksport (where found by Mrs. A. F. Chase), and which proves to have been well established in this station for some twenty years.

Potentilla recta L., the range of which is extended in Maine from the vicinity of Portland.

Galium boreale L., which may now be reinstated in the Maine lists from which it was recently dropped by reason of there being no record of a definite station in the state.

The section in which Miss Grey's collection was made lies twenty miles northwest of Bangor and some six miles from any railway.

Myosotis collina in Maine. — Reading the article on *Myosotis collina* in the January number of Rhodora recalls to my mind the fact that I collected it in June, 1897, at Drake's Island, York County, Maine, where I found it growing in abundance on the dyked marsh. It confined itself to the side of a deep ditch, spreading for a distance of several feet (an area of 6 feet is a moderate statement). It seemed to flourish equally well on the dry bank and in the water-bed of the ditch. Standing as thickly set as it is possible for plants to grow, and being then in full flower, it presented a very attractive appearance. Many of the flowers were pure white. — Kate Furbish, Brunswick, Maine.

Panicum barbulatum in Massachusetts. — Mr. Fernald has called my attention to the fact that *Panicum barbulatum* Michx., which he finds in my Herbarium from Milton, Mass., Aug. 23, 1894, has not before been recorded in Massachusetts. — George G. Kennedy.

Phlox pilosa in Connecticut. — Early in June, 1897, Miss Sanford of Oxford mentioned to me a flower found by herself and friends in a drive through Southbury, Connecticut, which made a mass of color visible from some distance. I at once suggested that it might be the sand-pink, *Silene Pennsylvanica*, Michx.; but she said, "No, I thought it looked more like a phlox." On seeing specimens I saw that she was right and the plant proved to be *Phlox pilosa*, L. A few days later I visited the locality and found it growing in abundance on both sides of the railway about one and a half miles west of the station at Southbury. It was scattered over several acres about half a mile from the nearest house and, although on the line of the railway, it appears to have been established there before the railway was built and to be truly indigenous.

It may be worthy of note that this locality is situated within the limits of the Southbury sandstone formation, a small isolated patch of a few square miles of the Connecticut River sandstone with its trap ridges, and thus is in a geological formation similar to that in much of New Jersey, which is the nearest locality of which I find previous record. — E. B. Harger.

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VERMONT HELVELLEAE.

Rhodora

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THE VERMONT BOTANICAL CLUB.

L. R. Jones.

The Vermont Botanical Club held its fourth annual winter meeting during the last week of January, and all who have attended this as well as the field meetings of last July, now realize that the Vermont Club is assured a long, useful and energetic life.

On July 4, 1895, a half-dozen Vermont botanists met by appointment at a lumber camp near the spruce-covered summit of Stratton Mountain, with two objects in mind. Of these the first was to explore the Torrey meadows, a large tract of natural meadow land which lies at an elevation of some 2,000 feet, and is especially rich in rare sedges; the second was to form an association which "might promote friendly intercourse among the students of botany in Vermont" and "secure a more thorough knowledge of the flora of the state." In both of these objects their success was beyond their hopes.

The club there formed now has 110 active members. The organization is of the simplest possible kind. Each year two meetings are held, a field meeting of two or three days in July and a winter meeting of two days in January or February. The officers of the club are a president, vice-president, and secretary. There are no fees and no treasurer. The president since the organization of the club has been President Brainerd of Middlebury College, and Cyrus G. Pringle has been the vice-president since the second meeting. The officers are authorized to "prepare the program, including papers and discussions for the winter meeting, and to arrange the time and place of the summer field excursion."

The plan in these summer trips has been to combine a pleasant outing with profitable botanical explorations, a thing easily accomplished in Vermont. Two of the last three of these excursions have been to Mount Mansfield and Smuggler's Notch, the third to Snake

Mountain. The probable choice for next July lies between Groton Pond, Lake Willoughby and one of the islands in Lake Champlain.

The winter meetings have all been held at the University of Vermont. The interest and attendance at these winter meetings has been surprisingly large. As is natural from the character and purpose of the organization, questions of systematic botany and plant distribution occupy the chief places on the winter programs. The papers are by no means confined to these subjects, however.

The last hour of the closing session was occupied by the annual roll-call; at this time each member is invited to respond with some crisp contribution, such as a report of some field observation, exhibition of a specimen, proposal of a problem for the club, etc. Some of these responses were among the most valuable and interesting features of the program.

Every member presenting a formal paper before the club, is expected to deposit, with the secretary, a written copy or abstract of such paper. In this way a rapid accumulation is taking place of contributions of much permanent value to students of botany in Vermont.

The club has had in mind from the beginning, the publication of catalogues showing the occurrence and distribution of Vermont plants. Dr. Grout's list of Vermont Mosses; Mr. Howe's of Vermont Hepaticae, and Mr. Orton's of the Parasitic Fungi, have already been printed. Dr. Burt has well in hand the study of the fleshy fungi. A committee of the club has been working upon a revision of the lists of the ferns and flowering plants of the state, and it is probable that this will soon be ready for publication, for which our thanks will be especially due to the skill and industry of our president.

University of Vermont.

A NEW MOSS FROM MT. DESERT ISLAND.

George G. Kennedy.

(Plate 5.)

Pottia Randii, nov. spec. Autoica: flores masculi gemmiformes; copiose paraphysati. Folia octofaria, integra, inferiora dissita erecta, superiora conferta obovato- et elongato-oblonga; costa excedente cus-

pidata; subcarinata; mollia; margine inferiore revoluto e cellulis angustis unistratosis prosenchymatosis composito instructa. Capsula gymnostoma erecta vel suberecta ovata et oblonga leviter gibba, collo conspicuo; tandem plerumque subincurva; sub ore subobliquato non angustata. Annulus e triplici serie cellularum parvularum compositus, persistens. Hab. in lapillis maritimis. Mt. Desert, Maine, U. S. A.

Autoicous: Male flower gemmiform; radiculose; one to six antheridia with many paraphyses; antheridial leaves strongly nerved, toothed at apex, cells large; female flower with five or more achegonia and many (34 in one case) paraphyses. Perichaetial leaves smaller than the tufted ones, not toothed. Leaves octofarious, loosely disposed on lower part of stem and forming a rosette above; 3 to 5 mm. long by 1 mm. wide; oblong; entire; apiculate; margin revolute to above the middle; when young very chlorophyllose and in upper half carinate; when old cells empty and leaf flat; stem leaves erect, not patent nor patulous.

Cells at base long rectangular, from .084 mm. x .024 mm. to .156 mm. x .036 mm.; above rounded hexagonal or rhomboidal, from .018 mm. x .021 mm. to .024 mm. x .042 mm. The rhomboidal cells at apex of leaf become narrowly rhomboidal at margin and are longer downwards until at point where revolute margin begins they are usually prosenchymatous long slender (1 x 8 to 10) cells forming the revolute margin of the leaf and at base becoming long and narrowly parenchymatous; smooth, in section near apex a few papillae occasionally seen. Costa stout, excurrent in a point of variable length; in section the costa is seen to be developed only on the lower side of the leaf, as in some Tortulas. Stem round; homogeneous; without central strand even in the leafy part.

Vaginule smooth; the unfertile archegonia with the paraphyses often bunched on one side of the vaginule as if one of the exterior archegonia was usually the fertilized one, and its growth left the others in a bunch at one side.

Seta 7 to 10 mm. long; sometimes two from same tuft: yellowish red, with spots or short sections of a deeper reddish brown; when very old deep brown.

Capsule 1.5 mm. to 2 mm. long by .62 mm. wide; oblong-oval, erect unequal, pachydermous; when very old sub-erect or slightly arcuate; not urceolate nor constricted below the mouth; from a reddish yellow to a deep brown color when fully ripe. No air space at base. Collum large with a single line of large stomata. Gymnostomous; mouth often oblique to the long axis. Annulus persistent, of three rows of very small cells. Operculum conical with a stout and often oblique beak. Calyptra smooth, light yellow with a dark brown apex, often falling with the operculum but the columella seldom attached. Spores yellow, papillose, ovate or rhomboidal-hexagonal seldom round; from .024 mm. to .035 mm. in longest diameter.

Plants to 15 mm. in height, caespitose or densely gregarious.

Hab. Among the stones in the sand by the seashore, Baker Island near Mt. Desert, Maine. Collected by E. L. Rand, July 15, 1898.

This very distinct moss is an interesting addition to the genus Pottia. The unequal capsule with oblique mouth, the conspicuous collum, and the evident border to the leaves are marked characteristics.

I first named it from Barnes' Key *P. littoralis*, Mitt. and sent specimens to Mr. Mitten for verification; he kindly returned me several specimens of *P. littoralis* and allied species, saying that this did not appear to agree with any of them, which fact was evident to me after looking at his *P. littoralis*.

I take pleasure in naming it for Mr. Rand whose work on the Flora of Mt. Desert is so well-known.

Readville, Mass.

Explanation of Plate 5.—*Pottia Randii*: fig. 1, plant, natural size; fig. 2, plant, enlarged; fig. 3, calyptra; fig. 4, fruit; fig. 5, empty capsule; fig. 6, leaf; fig. 7, leaf showing areolation; fig. 8, antheridia; fig. 9, archegonia; fig. 10, cross-section of leaf. Figs. 2–10 are all enlarged.

SOME ADDITIONS TO THE "FLORA OF MIDDLESEX COUNTY, MASSACHUSETTS."

Mabel Priscilla Cook.

Four seasons of botanical work by Miss E. L. Shaw and the writer in the vicinity of Lexington, Mass., have shown how exhaustive was the work of Messrs. Dame and Collins and their associates in the preparation of the Flora. During this period only ten species of phaenogamous plants from the region of Lexington have been added to the county list; and new localities for species already listed have been so rarely found as to prove of considerable local interest. In the accompanying notes asterisks denote species not credited in the Flora to Middlesex County. In the remaining notes additional stations are given for some species rare or not reported as of general occurrence in the county. As far as possible, the nomenclature of the Synoptical Flora of North America has been followed.

Anemone Canadensis, L., has been found for several seasons in two distinct stations. *A. cylindrica*, Gray, occurs on a hill in the south of Lexington.

Nasturtium officinale, R. Br., is abundant in a ditch in Concord, and it has to be removed in cartloads from a brook in Lexington to prevent its blocking the stream and so flooding the meadows.

The Mustard Family in Lexington has been further augmented by *Erysimum cheiranthoides*, L., *Sisymbrium altissimum*, L., **Brassica Japonica*, Siebold, and *B. oleracea*, L. *Cardamine parviflora*, L. (*C. hirsuta*, L., var. *sylvatica* of the Flora), was found at Lake Walden.

Dianthus deltoides, L., is well established in Lexington, and *D. Armeria*, L., given in the Flora as rather scarce, is quite common in different spots.

**Silene Armeria*, L., by the roadside, is new.

Stellaria uliginosa, Murr., was found on the edge of the stream in Shaker Glen, and *S. borealis*, Bigel., is quite abundant in North Lexington.

**Reseda lutea*, L., was found in Lexington cemetery.

Malva moschata, L., and *M. Alcea*, L., are persistent in fields in Lexington.

The summer of 1898 was peculiar in the presence of species not formerly noted. **Geranium pusillum*, L., came up abundantly in lawns where no new seed had been added. **Valeriana officinalis*, L., came up in several patches outside the cemetery in Lincoln, and **Silybum marianum*, Gaertn., in a garden which, in other years, had produced *Viola cornuta*, L., and **Cleome spinosa*, Jacq. None of these were planted, possibly the seeds were introduced in dressing.

Oxalis violacea, L., is quite plentiful on Mount Tabor, Lincoln.

Tephrosia Virginiana, Pers., "not reported in the eastern towns," grows in North Lexington. This is a new station also for *Genista tinctoria*, L.

Vicia tetrasperma, L., was found sparingly on dumps.

Poterium Canadense, Benth. & Hook., is sufficiently plentiful in Bedford to add a question-mark to the "scarce" of the Flora.

Potentilla recta, Willd., reported as scarcely established in Concord, has spread from the original station on Monument street to the other end of the town, where it has been found in different places in the fields of the Concord golf course.

The naturalization of *Trapa natans*, L., in the Concord River is so complete that it has become a nuisance and has to be weeded out of the Sudbury River above its junction with the Assabet, and far above the station where it was planted by Minot Pratt. I wonder that no

enterprising boy has turned it to account by gathering and selling the nuts. They are very popular with children in Austria.

**Epilobium lineare*, Muhl., var. *oliganthum*, Trelease, was found in Tophet Swamp, North Lexington.

Oenothera biennis, L., var. *grandiflora*, Lindl., persists in Lexington, the only remnant of an old garden.

Lythrum Salicaria, L., is abundant in a field in Bedford.

Aster infirmus, Michx., was found in woods near the railroad in Lexington, and a white variety of *A. Novae-Angliae*, L., in Woburn.

Arctium Lappa, L., var. *majus*, Gray, is common on Bedford street, Lexington.

Plantago Patagonica, Jacq., var. *aristata*, Gray, introduced with grass-seed, is only too well established.

Hottonia inflata, Ell., "not reported outside the Middlesex Fells," grows by the Concord turnpike.

Utricularia intermedia, Hayne, grows in Tophet Swamp, North Lexington, and *U. gibba*, L., in Winter Pond, Winchester.

Epiphegus Virginiana, Bart., is abundant in North Lexington and Lincoln.

Gratiola Virginiana, L., is in Shaker Glen.

**Pentstemon laevigatus*, Sol., var. *digitalis*, Gray, occurs in several places in Lexington.

Pycnanthemum lanceolatum, Pursh, grows in Bedford.

Symphytum asperrimum, Sims, is well established near Munroe Station.

Lithospermum arvense, L., *Echinospermum Lappula*, Lehm., and *Solanum nigrum*, L., are new to Lexington, and **Polygonum Virginianum*, L., on the old Concord road is new to the Flora.

**Polygonum lapathifolium*, L., grows about the new Cambridge reservoir.

The Endogens do not furnish many additions to the Flora. This is partly due to the fact that the studies on which these notes are based were not carried into the field of rushes, sedges, and grasses.

Sagittaria graminea, Michx., from Winter Pond, and *Pogonia verticillata*, Nutt., in N. Lexington, are the only additions to stations of endogens.

The work of converting a large area of meadow land in Lexington, Lincoln, and Waltham into a reservoir to supply the city of Cambridge, has led to an upheaval of territory which, we believe, will repay careful watching.

FUNGI IN GREENHOUSES.

HOLLIS WEBSTER.

THAT opportunities for collecting species of fleshy fungi are not ended with the setting in of winter will be evident to any one who undertakes periodical visits to greenhouses within reach. There, under glass, where summer and spring conditions are held captive, or made to order by florist and market-gardener, agarics, polypores and sometimes puffballs show themselves at intervals, sometimes in such force as to prove unwelcome guests. That the species are often the familiar ones of the region is to be expected, though the forms they take are occasionally somewhat novel in unimportant points. But there are also to be found, occasionally, species not to be met with elsewhere, stray representatives of the flora of other zones and countries brought in with imported earth.

An examination of the pages of Stevenson's British Fungi, or of Cooke's Handbook, will show that not a few so-called British species are known in Britain only from their occurrence in "stoves" or hot-houses. Some of these, described from collections originally made in such places, have later been discovered in their native habitats, perhaps in Australia or Ceylon, but others are still known only as regular or sporadic intruders in pots and beds in hothouses. Among them are species often of great delicacy and beauty, while others have a more purely botanical interest.

A few notes of a recent visit to some greenhouses near Cambridge are here given.

In the first house entered a crop of lettuce, the third of the season, was being harvested, and at the same time men were making over the ground for the next planting. An inquiry of the foreman for signs of toadstools brought an interested smile to his face, and he at once led us to a spot from which, as he said, the men had thrown out a bushel shortly before. A few were left, and these on examination turned out to be *Tricholoma sordidum*, Fr., not an uncommon species, but showing here great depth and freshness of color, which did not wholly survive the trip home. In another house, also among lettuce plants, on a high bench, was a great display of *Peziza vesiculosa*, Bull., in all stages, from the unopened globular young forms to the fully developed, crowded, irregular fruits, as big as small coffee cups. The owner, who was escorting us, remarked that he hoped to get rid of

these things by treating the earth before each planting to a long soaking in water as nearly boiling hot as he could get it through the hose from his boilers. He had already tried the experiment on another bed with some success. As the Peziza fruits were in fine condition and unusually clean and bright for this species, a quantity was taken for preservation in formalin as class material. In beds near by, a few wilted Coprinus stalks were here and there visible, showing by their headless, inky condition, that it was late in the day. Beside the manure heap, however, outside in the cold, though somewhat sheltered by boards, was an abundant crop of what was probably the same species, *Coprinus fimetarius* (L.) Fr., pushing hardily up into the March wind, in some cases actually through the snow. An inch below the surface were masses of it, still unexpanded and with short stems, waiting only the slightest encouragement to appear in force. Another house offered for exploration long beds of parsley. The crop of leaves was thick, just ready for the market, and some square yards of the bed were already stripped, showing the rows of bare stems a few inches high left standing for another growth. Search here revealed an attractive little reddish brown Peziza with expanded shallow cups a few lines across, seated apparently on the surface. Appearances were deceptive, however, for every cup was attached to a dark slender stem, sometimes a line, sometimes an inch or more in length, reaching down into the soil, where it sprung from an irregular blackish grain or lump, that looked like a bit of hardened earth — a sclerotium. Search showed this Peziza in some abundance, particularly in parts of the bed where the parsley was diseased or dead. In the latter case sclerotia were found often in quantities in and upon the remains of the underground part of the plants. Some of these sclerotia bore from twenty to forty fruits (apothecia). The species was submitted for determination to Dr. W. G. Farlow who writes that it is "*Sclerotinia sclerotiorum* (Libert), in very good condition. Rehm speaks of the apothecia as generally solitary, but in the original specimen of Libert they are clustered just as in your plant, and the microscopic characters agree in all respects with the description. *S. sclerotiorum* also occurs on other Umbelliferae, and in its conidial form is frequent in greenhouses, but its ascosporic form is not often seen."

OXYTROPIS CAMPESTRIS IN NORTHEASTERN AMERICA.

M. L. Fernald.

For many years the handsome *Oxytropis*, which in June colors, with its rosy flowers, miles of gravelly shore along the upper St. John river, has been poorly understood by American systematists. This is due, in part, to the fact that the plant is scarcely known to the botanists of northeastern America except from the too little visited St. John valley, and from the region about Quebec; and, in part, because those to whom the plant has been familiar have hardly realized the necessity of securing for study more complete material than is found in our herbaria.

During the past June it was the rare fortune of the author to spend some days in the St. John valley; and there, upon the gravelly delta formed at Fort Kent, at the junction of the Fish river with the St. John, was found this *Oxytropis* in the height of its season, with beautiful fresh rose-colored flowers, older faded bluish ones, and fairly developed pods on the same plant. Most of the plants bore about a score of spikes upon peduncles varying from 2 to 4 dm. in height; but plants with as many as sixty spikes were not exceptional.

This species was first reported, apparently, in Hooker's Flora Boreali-Americana where he treats Canadian specimens (from *Lady Dalhousie*, *Mrs. Percival*, and *Mrs. Shepard*) — presumably from Isle d'Orleans near Quebec — as a form of *O. Lamberti* (*O. Lamberti* α[1]), stating that they closely resembled standard figures of that species. In 1838, Torrey and Gray treated the Quebec plant (from *Mrs. Percival*) likewise as a form of *O. Lamberti*, though with some apparent hesitation (*O. Lamberti* δ ?[2]).

The St. John river plant, seemingly identical with that collected on Isle d'Orleans by Mrs. Shepard, Professor Brunet and others, was first detected during the survey of the "wild lands" of Maine, by Professor Goodale. Specimens of the fruiting plant were sent to Dr. Gray who wrote, "This seems to be near O. Lamberti, var. d., *Tor. and Gray*. However, I have a fancy that it may be O. Uralensis."[3] Later the plant was said to agree "pretty well with O. Uralensis, *L.*, var. b,"[4] an arctic plant.

1 Hook. Fl. Bor.-Am. i. 147. 2 Torr. & Gr. Fl. i. 339.

3 Goodale in Prelim. Rep. Nat. Hist. & Geol. Me. (1861), 366.

4 Goodale, l. c. (1862) 125.

In his early treatment[1] of the genus, however, Dr. Gray placed the St. John valley plant, as well as Labrador specimens, under the European *O. campestris*, DC., with "flores lutescentes, violaceo suffusi vel picti, rarius caerulei"; but, as Professor Goodale's specimens were in over-ripe fruit, the description of the flowers (so far, at least, as the Maine plant was concerned) was doubtless based upon the common yellow *O. campestris* of Europe. In reality, the flowers of specimens from the region whence Professor Goodale brought his fruiting plants are, as stated, bright rose-colored (the color of *Hedysarum boreale* or nearly that of *Desmodium canadense*), but in the dried specimens they fade to blue. Though he here referred the Maine plant to De Candolle's species Dr. Gray noted a slight difference, in the legumes, between the Maine specimens and those from Europe.

In his later treatment of the group, however, in 1884, the Maine and Quebec plants, and likewise those from Labrador, were referred by Dr. Gray[2] to *O. campestris*, DC., var. *caerulea*, Koch, it being stated that the corollas are generally blue, or blue and white, as in that European form. In the Labrador plant, nevertheless, Dr. Gray found the "slight introflexion of the dorsal suture" which he had previously noted in European specimens, but had found wanting in those from Maine.[3] Under the name *O. campestris*, DC., var. *caerulea* the Maine and Labrador plants were taken up by Dr. Watson in the sixth edition of the Manual; but, in the Illustrated Flora, Professor Britton has united all the Maine (and with it New Brunswick) Quebec and Labrador material as *O. campestris*, DC. (*Spiesia campestris*, Kuntze), giving the colors "white, yellowish white, or blue," as in the two European forms.

Color alone is an unsafe criterion for the distinction of species, or even varieties, especially in such a group as *Oxytropis;* but to one familiar with European figures of the yellow-flowered *O. campestris* there is little in the rose-colored flowers of the St. John valley plant to suggest specific identity. In size, too, the Maine plant so far exceeds European specimens of either *O. campestris* or its variety *caerulea*, that one hesitates at first sight to place the plants together. The Maine plant is so tall that, in 1893, after being compared with authentic specimens of *O. campestris* (at most 2 dm. high, with fruiting spikes 4 or 5 cm. long) and its smaller variety *caerulea*, the St. John river plant (4 to 5 dm. tall, with fruiting spikes 10 to 12 cm. long) was

[1] Gray, Proc. Am. Acad. vi. 235. [2] Proc. Amer. Acad. xx. 6. [3] l. c. vi. 236.

identified, with slight hesitation, with large specimens of the western *O. Lamberti*, Pursh, var. *sericea*, Gray.

Hundreds of specimens recently collected or examined in the St. John and Aroostook valleys show conclusively, however, that the large eastern plant cannot be referred to any form of *O. Lamberti*. In its longer thin slightly silky or glabrate leaves, closely flowered spikes, and especially in the thin papery texture of the legumes, the northeastern plant is well distinguished from the more western species with its thickish densely silvery-silky leaves, loosely-flowered spikes, and firm coriaceous legumes. In fact, the leaves and dense spikes, though large, are not unlike the general type found in the forms of *O. campestris*; and in their thin papery texture the legumes are certainly very like that species, with which for some years it has generally been associated. That it is, however, neither the true *O. campestris* nor its var. *caerulea* has already been sufficiently emphasized. Apparently no other form has been described which includes this attractive plant, and little hesitation is felt in proposing for it a new varietal name by which it may hereafter be distinguished from the overcrowded forms with which it has been confused.

Although this large plant of the St. Lawrence and St. John valleys is clearly different from *Oxytropis campestris* and its variety *caerulea*, its confusion with the latter form has been a natural one, for the larger plant has been represented in our herbaria only by scanty fruiting material. As already stated, however, Dr. Gray, in commenting upon the American plants, noted a slight difference between the legumes of the Maine specimens and those from Europe; and later he found in the Labrador specimens the same "slight introflexion of the dorsal suture" which he had already mentioned in the European plant. Notwithstanding this slight difference in the legumes, Dr. Gray then treated the Maine and Labrador plants as one form. The more southern rosy-flowered plant has been already sufficiently discussed. Judging from descriptions, the Labrador plant, on the other hand, referred by him to *O. campestris*, var. *caerulea*, does not differ appreciably from that European variety.

The two northeastern forms may be characterized as follows: —

Oxytropis campestris, DC., var. caerulea, Koch. Perennial from a stout multicipital caudex: leaves 3 to 15 cm. long; the 15 to 23 thin more or less sericeous or glabrate elliptic-oblong to linear-lanceolate leaflets generally 1 cm. (rarely 13 mm.) or less long: peduncles .5 to

2 dm. high, with appressed or slightly spreading pale and slightly nigrescent pubescence: spike short, subcapitate, with 3 to 10 blue or blue and white flowers: calyx with nigrescent hairs amongst the sub-appressed paler ones: legume of thin papery texture, oblong or ovoid, long-acuminate, 15 to 18 mm. long, with appressed nigrescent and pale hairs; the dorsal suture with a slight intrusion. — Synop. 181; Gray, Proc. Am. Acad. xx. 6, as to Labrador plant; Wats. & Coult. in Gray, Man. ed. 6, 137, in part. *O. campestris*, Gray, Proc. Am. Acad. vi. 235, in part, not DC. *Spiesia campestris*, Britton & Brown, Ill. Fl. ii. 308, as to Labrador and Hudson bay plant, not Kuntze. — In America known only from Labrador and the region of Hudson strait: barren hilltop, Square Island, Labrador, Aug. 16, 1882 (*J. A. Allen*, no. 37); Red Bay, July 12, 1891, Battle Harbor, July 18, 1891, Indian Harbor, Hamilton Inlet, August 2, 1891 (*Bowdoin College Exped.* nos. 23, 91, 178); Nain, August 11, 1897, Rama, August 20–24, 1897 (*J. D. Sornborger*, nos. 33, 34); Cape Chudleigh, August 5, 1884 (*R. Bell*); Ungava Bay, 1884 (*L. M. Turner*); Fort Chimo, September, 1896 (*A. P. Low* in Herb. Geol. Surv. Can. no. 16,300).

Var. **Johannensis.** Much larger throughout: leaves in well developed plants 2 dm. (becoming nearly 3 dm.) long; leaflets mostly larger, in maturity 2 or 3 cm. long: peduncles abundant (occasionally as many as 60), 1.5 to 3.5 dm long: spikes with about 12 rose-colored (rarely white) flowers, drying bluish; in fruit becoming 5 to 12 cm. long: legumes 2 to 2.5 cm. long, with a less apparent internal projection of the dorsal suture. — *O. Lamberti* α, Hook. Fl. Bor.-Am. i. 147 (excluding cited figures). *O. Lamberti* δ ?, Torr. & Gray, Fl. i. 339; Gray, acc. to Goodale in Prelim. Rep. Nat. Hist. & Geol. Me. (1861) 366. *O. Lamberti*, var. *sericea*, Fernald in Hay, Bull. Nat. Hist. Soc. N. B. xii. 69 & Proc. Portl. Soc. Nat. Hist. ii. 79; not Gray. *O. Uralensis* β, Gray, acc. to Goodale, l. c. (1862) 125, not Torr. & Gray. *O. campestris*, Gray, Proc. Am. Acad. vi. 235, as to Maine plant & Man. ed. 5, 133, not DC. O. *campestris*, var. *caerulea*, Gray, Proc. Am. Acad. xx. 6, in part (Northern Maine & Lower Canada); Wats. & Coult. in Gray, Man. ed. 6, 137, in part; not Koch. *Spiesia campestris*, Britton & Brown, Ill. Fl. ii. 308, in part (Quebec, Maine and New Brunswick), not Kuntze. — A handsome plant, flowering in June and early July, often abundant on the gravelly river-beaches of the St. John and its tributaries in northern Maine and New Brunswick; also on the Restigouche, and long known from the St. Lawrence valley near Quebec. Specimens examined: Isle d'Orleans, below Quebec (*Mrs. Shepard, Prof. Brunet*); on the St. John near Seven Islands, Maine, 1861 (*G. L. Goodale*); Fort Kent, Maine, 1881 (*Kate Furbish*); in great abundance on the Fish River delta, Fort Kent, June 15, 1898 (*M. L. Fernald*, no. 2289); Grand Isle, Maine, June 20, 1898 (*M. L. Fernald*, no. 2290); Van Buren, Maine, July 21, 1893 (*M. L. Fernald*, no. 25); by the Aroostook river, Caribou, 1880 (*Kate Fur-*

bish) ; mouth of Madawaska river, New Brunswick, July 13, 1879 (*G. U. Hay & G. F. Matthew*) ; crevices of ledges, Aroostook Falls, New Brunswick, July, 1893 (*M. L. Fernald*) ; rocky banks, Hero's Rapids, Restigouche river, New Brunswick, August 2, 1896 (*G. U. Hay*).

NEWLY-OBSERVED PLANT STATIONS IN EASTERN MASSACHUSETTS. — During the past season I have found the following interesting plants in Eastern Massachusetts : —

COLUTEA ARBORESCENS, L. This I found near the roadside in Arlington, not far from the Winchester line. I also found some of it in a vacant lot on Boylston Street, Boston, where it had probably escaped from cultivation in the Back Bay Fens.

JUNCUS DICHOTOMUS, Ell. This grows abundantly in a swamp near the railway at East Lexington. Its range in Gray's Manual is "low sandy grounds, N. J. to Florida" ; and, so far as I know, it has been found but once north of these limits. Then it was collected by M. L. Fernald at Orono, Me.

LYTHRUM ALATUM, Pursh. I found this in limited quantity in the same swamp at East Lexington.

EUPHORBIA COROLLATA, L. This grows on the embankment of the Boston aqueduct at South Natick, where it is probably an introduced plant. — C. H. KNOWLTON.

SOME NOTEWORTHY SPECIMENS OF THE FRINGED GENTIAN. — The description in the January RHODORA of a prolific gentian (*G. crinita*, Froel.) recalls several extraordinary specimens of the same species which I have seen. One of these, found isolated in a large pasture near Hartford, was 28½ inches high, and had the symmetrical shape of a small cypress tree. It bore 76 buds and flowers; but although it was allowed to go to seed, no gentians appeared in this pasture for the next three years. The largest gentian which I have ever seen was found at North Bloomfield, Conn., by Mr. C. H. Pember ; and although less symmetrical than the one just mentioned, it had no less than 176 buds and flowers. This specimen, which was 38 inches high and 7 inches in diameter, was exhibited at the Botanical Section of the Hartford Scientific Society. Another noteworthy specimen of the same species, found at Glastonbury, Conn., by Mr. A. W. Driggs, bore 124 buds and flowers.

Although Professor Gray refers to the seeds of the gentian as "innumerable," I once counted those in one capsule and found 290. This would make 51,000 for the largest plant I have mentioned. It is a question, however, what becomes of them all. Certainly very few grow. — H. S. Clark, Hartford, Conn.

An apetalous form of Arenaria groenlandica. — Last summer Mr. E. L. Rand sent the writer an apetalous specimen of *Arenaria groenlandica*, collected near Seal Harbor, Mount Desert Island, Me., July 10, 1898. The plant seems in all regards normal except in the absence of petals. The tendency of this species to produce smaller and smaller flowers as the season advances has already been noted.[1] But in a considerable suite of specimens of this species examined by the writer in the revision of Arenaria for the Synoptical Flora, only two individuals were found in which the petals were shorter than the sepals; and in these, collected by Mr. M. L. Fernald, on Mount Saddleback, Me., altitude 1,350 m., August 17, 1894, the anthers were purple, and infested by *Ustilago antherarum*, to which some dwarfing of the other floral organs may well have been due. In Mr. Rand's plant, however, the anthers, as well as the sepals and pistils, have their usual normal appearance, while the petals are not merely reduced but completely wanting, leaving the cup-shaped expansion of the disk somewhat more conspicuous than usual.

Apetalous flowers in this species do not appear to have been mentioned in literature, even in Professor Warming's excellent and detailed paper upon the different forms of flowers in Caryophyllaceæ.[2] It remains for future observation to determine whether this apetalous condition of our well-known mountain Arenaria is a seasonal development or state, or whether the trait is perpetuated by heredity, and may have varietal significance. — B. L. Robinson, Gray Herbarium.

A new station for Potentilla tridentata. — While on a botanizing trip to Mount Wachusett last September, I found a few specimens of *Potentilla tridentata*, Ait., on the summit of Little Wachusett Mountain, at an altitude of only 1,560 feet above sea-level. This is perhaps the lowest altitude at which this plant occurs in Worcester County. It

[1] Proc. Am. Acad., xxix, 329.

[2] Om Caryophyllaceernes Blomster. Copenhagen, 1890.

had previously been reported in this county only from Mount Wachusett, which is about two miles north of the new station and 440 feet higher. It is quite abundant there, and is one of the most characteristic plants of the summit. — ROLAND M. HARPER, Southbridge, Mass.

CORRECTION IN REGARD TO VIBRISSEA CIRCINANS (PERS.) MASSEE. — This species was incorrectly included in the list of Vermont Helvelleæ, in the April RHODORA. The collection should have been referred to *Vibrissea lutea* Pk., which Figs. 8–8c, Pl. 4, therefore illustrate.

I am under obligation to Drs. Farlow and Thaxter for directing my attention to the error, and to Dr. Farlow for an opportunity to examine *Leotia circinans* Pers. in Klotzsch Herb. Viv. Myc. 139, in Linhart Fungi Hungarici 59, and in Rabenhorst Fungi Europ., Series 2, No. 39, from all of which my specimens are quite different. — E. A. BURT.

A PROJECTED CHECK-LIST OF NEW ENGLAND PLANTS.

SOME months ago the members of the New England Botanical Club determined that the preparation of a careful catalogue of New England plants would not only be a desirable undertaking for the Club, but form a well-nigh necessary preliminary to any general or comprehensive work on the flora. As the membership of the Club is composed of professional botanists, closely occupied with teaching or research work, and of not less busy amateurs, whose time for botanical work is, for the most part, strictly limited, it is wholly impracticable to attempt the early publication of a complete catalogue of this kind. Parts will be issued at irregular intervals as prepared, and after due criticism and correction may, it is hoped, be ultimately brought together as a whole.

An essential feature of the proposed list is a sharp distinction between entries which rest upon *personal examination of existing specimens* (indicated by the sign +) and second-hand (even though fully credited) reports (indicated by the sign −). Various natural orders have been undertaken by different members of the Club, who in preparing their lists are expected (after acquiring an accurate knowledge of specific and varietal characters) to examine the representation of their respective groups in the larger herbaria of Cambridge, Boston and whenever possible, of other botanical centres in New England, also to consult all available local floras. Two records are to be prepared: — 1. (For pub-

lication.) A list of the New England species and varieties, together with an indication of the states from which specimens have been actually seen or published reports of occurrence found. 2. (For deposit in the Club archives.) More extended memoranda, stating the herbarium in which each plant from each state has been examined and the local flora in which each report appeared.

The object of the list is primarily botanical and not nomenclatorial, and perfect uniformity of nomenclature is quite out of the question. In generic names no material departure from the usage of Engler & Prantl's Natürlichen Pflanzenfamilien (Berlin rules) is anticipated and in the vascular plants specific nomenclature will be determined, at least for the present, by the uniform adoption of the first available name *under the genus*. This combination of rules gives, it is believed, the maximum of definiteness with the minimum of change.

The subdivision of the New England flora according to state boundaries, while artificial, is for several reasons the only subdivision practicable in the present list, and as each of the six states possesses much individuality in its flora, this division is neither devoid of interest nor valueless as a rough beginning for more detailed work on the internal distribution of New England plants.

The lists as here published, although the result of much painstaking application on the part of the compilers, can rarely be complete, and therein lies much of their interest, since they will give ocular evidence of many surprising lacunæ in our present knowledge of distribution and show where the attention of the collector may be profitably directed. In examining them, readers are requested to note especially what species are not marked with the plus sign as having been seen from their states. Persons possessing a knowledge of the occurrence of these species in states other than those marked with the plus sign will confer a great favor by sending to the compilers specimens to demonstrate the presence of such species in the unrecorded states. Only by such cordial coöperation upon the part of the New England botanists can the ultimate catalogue be given the completeness which is desired.

The following list by Mr. Deane will indicate the manner of publication proposed. In order that these lists, which may sometimes be of length, shall not encroach upon the space to be allotted to other subject-matter, they will be treated as supplementary material, but the pages added to include them will, for convenience in indexing and citation, be numbered continuously with other parts of the journal.

PRELIMINARY LISTS OF NEW ENGLAND PLANTS, — I. ERICACEAE.[1]

WALTER DEANE.

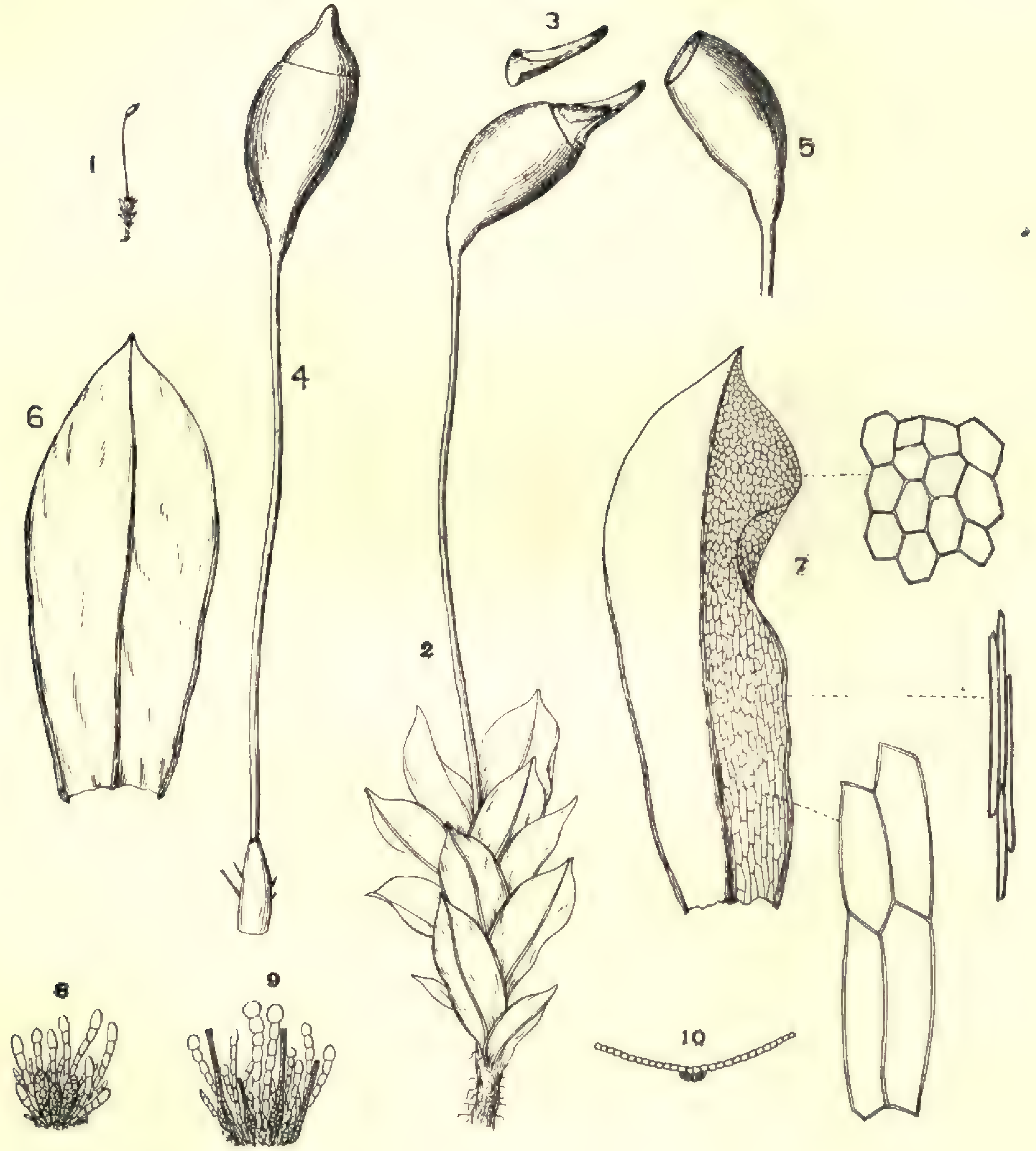
[The sign + indicates that an herbarium specimen has been seen; the sign — that a printed record has been found.]

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Andromeda ligustrina, Muhl.	+	+	+	+	+	+
" Mariana, L.					—	
" polifolia, L.	+	+	+	+		+
Arctostaphylos alpina, Spreng	+	+				
" Uva-ursi, Spreng.	+	+	+	+	+	+
Bryanthus taxifolius, Gray	+	+				
Calluna vulgaris, Salisb.	+			+	+	
Cassandra calyculata, Don.	+	+	+	+	+	+
Cassiope hypnoides, Don.	+	+				
Chimaphila maculata, Pursh.	—	+	+	+	+	+
" umbellata, Nutt.	+	+	+	+	+	+
Chiogenes serpyllifolia, Salisb.	+	+	+	+	+	+
Clethra alnifolia, L.	+	+		+	+	+
Epigaea repens, L.	+	+	+	+	+	+
Erica cinerea, L.				+		
" Tetralix, L.				+		
Gaultheria procumbens, L.	+	+	+	+	+	+
Gaylussacia dumosa, Torr. & Gray	+	—		+	+	+
" " var. hirtella, Gray				+	+	
" frondosa, Torr. & Gray	—	+		+	+	+
" resinosa, Torr. & Gray	+	+	+	+	+	+
Kalmia angustifolia, L.	+	+	+	+	+	+
" glauca, Ait.	+	+	+	+		—
" latifolia, L.	+	+	—	+	+	+
Ledum groenlandicum, Oeder (*L. latifolium*, Ait.)	+	+	+	+		+
Leucothoë racemosa, Gray				+	+	+
Loiseleuria procumbens, Desv.	—	+				
Moneses grandiflora, Salisb.	+	+	+	+	+	+
Monotropa Hypopitys, L.	+	+	+	+	+	+
" uniflora, L.	+	+	+	+	+	+
Pterospora Andromedea, Nutt.		+	+	—		
Pyrola asarifolia, Michx.	+	+		—		
" chlorantha, Swartz	+	+	+	+	+	+
" elliptica, Nutt.	+	+	+	+	+	+
" minor, L.	+	+	+			
" rotundifolia, L.	+	+	+	+	+	+

[1] Printed in RHODORA as supplementary material.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Pyrola rotundifolia, var. uliginosa, Gray . . .			+			
" secunda, L.	+	+	+	+	+	+
" " var. pumila, Paine	+	+	+			
Rhododendron lapponicum, Wahl.	+	+				
" maximum, L.	+	+	+	+	+	+
" nudiflorum, Torr.		+	+	+	+	+
" Rhodora, Don.	+	+	+	+	+	+
" viscosum, Torr.	+	+		+	+	+
" " var. glaucum, Gray . .				+	+	+
" " var. nitidum, Gray . .				—		
Vaccinium arboreum, Marshall						—
" caespitosum, Michx.	+	+	+			
" canadense, Kalm	+	+	+	—		
" corymbosum, L.	+	+	+	+	+	+
" " var. amoenum, Gray . .	+	+	+	+	—	
" " var. atrococcum, Gray . .	+	+		+	+	+
" " var. pallidum, Gray . . .	+	+	+	+	+	+
" macrocarpon, Ait	+	+	+	+	+	+
" Oxycoccus, L.	+	+	+	+	+	+
" pennsylvanicum, Lam.	+	+	+	+	+	+
" " var. angustifolium, Gray .	+	+	+			
" " var. nigrum, Wood . . .	+	+		—		
" stamineum, L.				+		+
" uliginosum, L.	+	+	+			
" vacillans, Kalm	+	+	+	+	+	+
" Vitis-Idaea, L.	+	+	+	+		

Vol. 1, No. 4, including pages 59 to 76 and plate 4, was issued April 1, 1899.



C. E. Faxon del.

Pottia Randii, nov. spec.

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

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THE CONNECTICUT VALLEY BOTANICAL SOCIETY.[1]

MARIA L. OWEN.

THE sketch of the New England Botanical Club recalls a similar association, the Connecticut Valley Botanical Society, founded in June, 1873. I had then lived in Springfield twenty years and had hardly met a botanist in all that time. Of course, I longed for companionship. So at last I took pains to seek the acquaintance of Miss Shattuck, the teacher of botany at Mt. Holyoke Seminary, pulled the wires that got me invited there, and then laid before her my plan for stated gatherings of the botanists of the Valley. She approved and told me that the Rev. David Peck of Whately would be sure to help me. When I wrote to him he was interested, but said that the Rev. Henry G. Jesup of Amherst would be an invaluable helper,—and so he proved. Next I invited the three to meet at my house, June 10th, 1873. They came, stayed a day and a night, and we laid our plans, formed and adopted a constitution, and chose a president and secretary, leaving the other offices unfilled. The first article of the constitution was: "The undersigned, for the promotion of the study of botany, and for mutual improvement in that science, form an association, to be called the Connecticut Valley Botanical Society."

Now, no two clubs are exactly alike, but it seems to me that the aims of this society and yours are the same. In one respect, however, the New England Botanical Club can, if it insists upon the point, claim to be the first of its kind in New England, it is a club for gentlemen only, while ours was open to both sexes. I was secretary from the beginning, and have, as a valued perquisite (the only one that anybody ever had), the book which contains the complete records. It was a very success-

[1] This bit of botanical history, which is an extract from a personal letter to a member of the New England Botanical Club, is here published by the kind permission of its author.—ED.

ful association. Our meetings were held in Amherst, South Hadley, Hanover, N. H., and elsewhere, and in all places college officers, students, and the best people of the neighborhood who cared for our subject attended them. Dr. Gray came to our sixth meeting, which was held at the Seminary, and brought specimens of *Gloriosa*, which he made the theme of a pleasant and instructive talk. He spoke also of the fertilization of *Apios tuberosa*. President Clark of Amherst was the delight and pride of our local membership, — what a talker he was! — and he always came with his large botanical box full of choice specimens. Those happy times! Nothing less than our complete record can tell of them adequately, but I will give you a few of the best-known names from our list of signatures: C. H. Hitchcock of Dartmouth and his brother Edward of Amherst, William S. Clark of Amherst Agricultural College, Edward Tuckerman, D. P. Penhallow, a young man then, who has made a name for himself since; A. P. Morgan and his wife, Laura V. Morgan, both ardent students of fungi, and that, in 1873, was to be far ahead of the times; J. G. Scott of the Westfield Normal School, William Penn Brooks, who has also become widely known, and Warren Upham, then at Dartmouth; Mr. C. G. Pringle, the well-known collector, said he would come and authorized us to sign his name, but something prevented his attendance after all; Dr. Gray added his name to the list, — the only ceremony required for membership; we had no fees.

The members were so far apart that we had but two meetings a year and later only one; and though that diminished to none, I feel that the Society never *died*, though it slept. Some of its members died, however, and some moved far away. Botanists became more numerous in the Valley so that nobody was lonesome. We had a flourishing society in Springfield while the Valley Society was still holding its meetings, so these and some other causes led to the rest in its action which has not yet been broken.

I ought to say something about the members utterly unknown to fame, who were drawn out by the association, — people from little country towns, women and men both, hard workers in bread-winning occupations, who yet managed to find time for their beloved science and made progress in it. They were born botanists, and that is the only way you can account for such things. It is a long story, but I felt called upon to say something for the dear old Society and could not well say it in fewer words.

FURTHER ADDITIONS TO THE FLORA OF MIDDLESEX COUNTY, MASS.

Ernest C. Smith.

For seven years past I have collected plants in Framingham and the adjoining towns, occasionally meeting species not recorded in the Middlesex Flora and more frequently finding plants there noted as rare, or credited to only a few isolated stations. Many, if not all these, have probably been collected before, but have not to my knowledge previously been published. Hoping to bring out similar reports from other collectors, I submit the following list, each species being represented in my herbarium by specimens collected within the limits of the town of Framingham.

An asterisk is prefixed to species not mentioned in Dame and Collins' Flora of Middlesex County.

Hesperis matronalis, L. Well established and spreading near an old cellar-hole.

* *Silene dichotoma*, Ehrh. Abundant in several mowing fields and back yards; associated with *S. noctiflora*, L.

* *Oenothera fruticosa*, L. A single specimen.

* *Lonicera coerulea*, L. Holliston and South Framingham. (This is credited to Townsend in Introduction to Middlesex Flora.)

* *Solidago rigida*, L. Two specimens only.

* *Krigia amplexicaulis*, Nutt. Wet meadow in northern part of town. Abundant.

Chiogenes hispidula, Torr. & Gray. Found in Sudbury and Framingham in cold bogs, but producing neither flowers nor fruit.

* *Polygonum lapathifolium*, L. Not uncommon.

* *Salix myrtilloides pedicellaris*, Anders. The type of the species and the variety, as they occur here, seem quite distinct, the type having its leaves prevailingly obovate and the variety showing very narrow leaves.

* *Sagittaria Engelmanniana*, J. G. Smith. Gleason's Pond (one of the original stations from which type specimens were procured).

* *Habenaria bracteata*, R. Br. One specimen only, from South Framingham.

Spiranthes graminea, Walteri, Gray (*Spiranthes praecox*, Watson). Found several times.

* *Hemicarpha subsquarrosa*, Nees. Shore of Waushacum Pond, in sand; and shore of Gleason's Pond, in gravel. In the latter situation it is matted with, and almost hidden by, plants of *Fimbristylis autumnalis*, Roem & Schutt.

* *Eleocharis palustris glaucescens*, Gray. Abundant on the shore of Waushacum Pond.

Cladium mariscoides, Torr. Very abundant on margin of Waushacum, with *Carex filiformis*, *Carex riparia* and *Eleocharis palustris*, forming a belt for long distances, from ten to twenty feet broad. The Cladium is by far the most conspicuous element.

* *Panicum xanthophysum*, Gray. Not uncommon.

* *Panicum macrocarpon*, LeConte. After consulting the specimens in the Gray Herbarium and comparing with the descriptions in Britton & Brown's Illustrated Flora, I am convinced that most of what passes for *P. latifolium* from New England is properly referred to *P. macrocarpon*. Certainly my specimens belong there.

* *Panicum sphaerocarpon*, Ell. Abundant.

* *Panicum Atlanticum*, Nash. Not common.

* *Panicum boreale*, Nash. Not common.

* *Panicum Columbianum*, Scribn. Common.

* *Panicum pubescens*, Lam. Common.

Not all these Panicums are actual additions to the list, though the names are new there, being the result of recent special work on the perplexing dichotomum group.

* *Bromus brizaeformis*, Fisch. & Meyer. Collected for three years past on a dump near Leonard's Pond.

Framingham, Mass.

THE POLLUTION OF WATER-SUPPLIES BY ALGAE.

G. T. Moore.

The question of a pure water supply is one which is of so much importance and interest that it can hardly be said to apply to any special locality. Throughout the country more and more attention is being given to it by both engineers and biologists, and new problems are constantly developing with regard to it. To Massachusetts, however, is due the credit of being the first state to begin any systematic

study of the various organisms found in water-supplies, and it is through the efforts of the Massachusetts State Board of Health, that most of the information we have on the subject has been acquired. Up to the present time, the work has consisted largely of a determination of the occurrence, quantity, and effect of the algae, while the question as to the best way of preventing their appearance is one still to be answered.

As a rule, the larger and more easily recognized algae do not produce any pollution. Such forms as Spirogyra, Zygnema, Cladophora, Conferva, etc., while they may occur in ponds and reservoirs to a considerable extent are not likely to cause trouble unless it be a mechanical one. The case is different, however, when we come to some of the more minute species. Here the inconvenience and damage caused is frequently great, and while they do not actually poison the water it is rendered so disagreeable and unfit for use that, temporarily, the effect is much the same. Perhaps the best known forms responsible for this contamination are the members of the group popularly called the "blue-green algae." These plants, the *Cyanophyceae,* are considered by some to be outside the limits of the true algae, and are called *Schizophyceae,* which are classed, together with the bacteria, under the *Schizophyta.* They certainly greatly resemble the bacteria both as to their morphology and general mode of life, and one reason the bacteria are now considered plants is because of the similarity between them and the *Cyanophyceae.*

The forms of the blue-green algae are extremely various. Sometimes the plant consists of a single cell, less than $\frac{1}{100}$ mm. in diameter, which may or may not be united into colonies of considerable size. Again the plants are made up of bead-like chains of cells such as are found in the nostocs; or the filament of cells may be of the same diameter throughout its length, as in the oscillatorias. During the summer, especially, these algae multiply very rapidly by the simple division of their cells, and under favorable conditions are apt to occur is such quantities as to produce the so-called "pig-pen" odor. This is essentially the result of decomposition and is due to the breaking up of compounds of sulphur and phosphorus in the presence of a high percentage of nitrogen. In addition to the trouble caused by the decay of these forms, there are some species which have what may be called a natural odor, which is generally due to an oily substance contained within the cells of the plant. This oil may be liberated in various ways, and then the water becomes charged with the characteristic

odors, which have been likened to that of grass, fish, ripe cucumbers, candied violets, etc. Sometimes the odor is accompanied by a fishy, oily taste, and there are algae which impart a characteristic taste without any odor. *Anabaena* is one of the most troublesome genera producing these natural odors. It gives rise to a strong scent not unlike the odor of raw green corn, or nasturtium stems. *Coelosphaerium*, which frequently occurs with *Anabaena*, is also the cause of a distinct odor and taste.

Jamaica Pond, at Jamaica Plain, Mass., while not a part of any water-supply, is interesting, because it illustrates to what an enormous extent a member of the *Cyanophyceae* may multiply in its water, and render it unfit for use merely because of the quantity of vegetation it contains. In the spring, this pond may be seen to assume a light reddish-brown color. As the season advances the water becomes darker and darker until it is of a decided chocolate hue, — certainly not a shade which would suggest that it was affected by a "blue-green" alga. Such is the case, however, for microscopic examination shows that the water is filled with the minute filaments of *Oscillatoria prolifica* Gomont. This plant is made up of a series of cells not over $\frac{1}{200}$ mm. in diameter, and except for its color presents the usual appearance of an oscillatoria. The question as to what gives the cells their chocolate color has been the subject of some controversy. It is not yet definitely settled, but it seems probable that the change in hue from blue-green to reddish brown is due to the presence of gas vacuoles near the surface of the cells which produce an optical effect sufficient to give the chocolate appearance. The reddish-brown color is not an unusual one among the *Cyanophyceae*, it being found in a number of genera besides *Oscillatoria*, one of the most notable examples being that of *Trichodesmium erythraeum* Ehrenb., the periodical occurrence of which has given the Red Sea its name.

It was formerly supposed that the minute plants belonging to the *Diatomaceae*, had no injurious effect upon water, and, although they are frequently the most common vegetation found in ponds, they were passed over as being unimportant. But in recent years it has developed that certain diatomes are capable of imparting an oily, vegetable taste, while others produce a distinct aromatic odor. *Asterionella*, a linear form, inflated at the ends and usually symmetrically arranged in the shape of a star, gives rise to a "rose-geranium" odor which may become fishy as the number of plants increase. There are

other diatomes which possess a characteristic disagreeable taste, and numerous forms cause serious trouble in water that is to be used in the manufacture of paper.

Perhaps the organism which produces the most unpleasant and disagreeable effect upon the various water-supplies in New England is *Uroglena*, a form which although claimed by zoölogists, has probably just as good a right to be studied by botanists. This occurs only during the colder months of the year, being most luxuriant when the water is covered with ice. In a very general way it may be said to resemble a volvox colony, that is, it consists of a gelatinous sphere in the periphery of which are embedded numerous green cells. These cells are each provided with a red spot and a pair of cilia of unequal length and these by their undulatory motion revolve the colony through the water with considerable rapidity. The pollution which *Uroglena* produces is caused by an oil contained in the form of small globules in each cell. These cells are so delicate that the slightest change in the condition of the water is apt to bring about their disintegration and thus the oil is liberated, giving to the water a most disagreeable oily, fishy taste. This last season has been a particularly favorable one for *Uroglena* in Massachusetts, it being especially troublesome at Hingham, and occurring at various other places.

The question of how to prevent the appearance and growth of algae in water-supplies is, of course, an important one. While they can not be said to be actually injurious to health and there is no occasion for the alarm, which is sometimes aroused by newspaper articles, the inconvenience they cause is so considerable and the contaminated water so disagreeable that a practical means of removing them is much to be desired. Thus far but little has been accomplished. It is known, of course, that the freer from organic matter a reservoir can be kept, the less likely it is to become infected by algae, and large sums of money are expended by water-boards in an effort to clean the ponds and reservoirs which furnish the supply of water. But when we consider that any good water contains all the elements necessary for the growth of these plants and that most of them have the power of forming resting spores, which will tide them over unfavorable conditions and which can be carried great distances by the wind or other agencies, we see what a difficult problem the whole subject presents. By obtaining a sufficiently large number of statistics with regard to the exact conditions under which these organisms occur and by finding out through

laboratory cultures, the most and least favorable circumstances attending their growth and reproduction, some rule may perhaps be deduced, some combination of temperature and nutrient solution, that will make it possible at least to predict the appearance of objectionable forms. Arrangements could then be made for shutting out that particular part of the supply and preventing the contamination of all the water.

EXCURSIONS OF THE JOSSELYN SOCIETY.

M. L. Fernald.

During the field-excursions of the Josselyn Botanical Society of Maine, at the annual meeting in Waterville, August 30 to September 2, many phanerogams of unusual interest were collected in Waterville, Winslow, and Belgrade. Three plants not before detected in the state were found: *Rhynchospora capillacea*, Torr., var. *leviseta*, Hill, in crevices of wet calcareous ledges by the Kennebec, Winslow; *Carex granularis*, Muhl., var. *Haleana*, Porter, common on ledgy shores of the Kennebec; and *Eupatorium purpureum*, L., var. *amoenum*, Gray, scarce, by the Kennebec, Waterville; the two former not previously known in New England. Two more species, not yet satisfactorily determined, may be new to the state. Two other plants, not before listed from Maine, though formerly collected at other stations in the state, are *Cyperus aristatus*, Rottb., abundant on sandy and gravelly banks of the Sebasticook at "Beulah," Winslow; and *Circaea intermedia*, Ehrh., in river thickets along the Kennebec, Winslow. This interesting *Circaea*, which in central Maine seems to replace the more southern *C. Lutetiana*, is a common European type, but it has never been recorded in America. The species occurs also in Piscataquis and Penobscot counties, the earliest collection having been made by the Rev. A. P. Chute, in 1847, near Hunt's, on the east branch of the Penobscot.

Some specially noteworthy plants, not before recorded from the Kennebec valley, were *Woodwardia virginica*, Smith, abundant in a bog, Belgrade; *Juncus alpinus*, Vill., var. *insignis*, Fries, in crevices of calcareous ledges by the Kennebec, Winslow; *Quercus macrocarpa*, Michx., abundant about "Beulah," also a single tree by the river, Waterville (formerly reported by Prof. E. W. Hall); *Aster novae-angliae*, L.,

abundant at "Beulah" and along the Kennebec, Winslow; *Aster tardiflorus*, L., by the Messalonskee, Waterville; *Sagina procumbens*, L., river-banks; and *Elatine americana*, Arn., very abundant in mud by the Messalonskee.

Tofieldia glutinosa, Willd., collected in 1829 by J. W. Robbins, "on the banks of the Kennebec, at Teconic Falls," but not since seen, was searched for by many members; but not until after the adjournment of the regular meetings was the plant found by E. B. Chamberlain and the writer, a single specimen growing in the midst of *Rhynchospora capillacea*, var. *leviseta*, thus reëstablishing Robbins's station. Other interesting plants collected on the excursions were *Solidago humilis*, Pursh, by the Kennebec, Waterville and Winslow; *Myriophyllum alterniflorum*, DC., Great Pond, Belgrade; *Astragalus alpinus*, L., by the Kennebec, Winslow; and *Halenia deflexa*, Griseb., var. *heterantha*, Fernald (RHODORA, i. 37), by a spring, "Beulah."

SOIL-PREFERENCES OF SOME LESS USUAL VASCULAR PLANTS IN CENTRAL CONNECTICUT.

L. ANDREWS.

As soils and altitude have much to do with the distribution of plants the town of Southington, situated in Central Connecticut, possesses from its varied conditions advantages in a botanical way probably not surpassed by any area of its extent in the state. With an altitude ranging from 100 to 1000 feet, it possesses soils which on one side extend into the granite region of western Connecticut and on the other cover extensive trap dykes, while the intermediate section, resting upon Triassic sandstone, has a covering of drift varying from heavy clay loams and gravel hills to the most barren shifting white sands. That this diversity of soil conditions favors an equal variety of vegetation is shown by the fact that one thousand species have already been collected within this area of thirty-six square miles.

In the following notes are mentioned some of the more interesting plants of Southington and its immediate vicinity.

Populus monilifera, Ait., the cottonwood, although seeming to prefer damp locations, has been found on Meriden Mountain growing among the rocks at an altitude of five hundred feet. The beautiful little orchid *Li-*

paris liliifolia, Richards., one of the Tway-blades, usually grows in sandy soils but is here found at the summit of a trap dyke, at an altitude of one thousand feet, growing under the low branches of the ground hemlock, *Taxus Canadensis*, Willd., which is rare in this region and found only at this station. *Myosotis verna*, Nutt., is found in the thin crust of soil, high up on the same trap dyke, which is also the only station for *Cardamine parviflora*, L., yet found in this region. *Arctostaphylos Uva-ursi*, Spreng., the bearberry, with its glossy evergreen leaves and bright red berries, so showy in early winter, grows still further out upon the exposed edge of the same cliff, where also on the precipitous rocks cling the hare-bell and the rare cliff-brake, *Pellaea atropurpurea*, Link.

On the lower ledges of the mountain occur the three green orchids *Habenaria bracteata*, R. Br., *H. Hookeri*, Torr., and *H. hyperborea*, R. Br., the last sparingly represented at a single station.

On a sandy plain, but in a depression which is well filled with springs, making it quite wet during the whole season, are found five species not seen elsewhere in this vicinity, namely, the ever-attractive orchid, *Arethusa bulbosa*, L., the linear-leaved golden-rod, *Solidago tenuifolia*, Pursh, the club-moss, *Lycopodium inundatum*, L., and two grasses, *Muhlenbergia glomerata*, Trin., and *Trisetum palustre*, Torr., *Aster leariifolius*, L., occurs on the white sand plain, which extends nearly across the town, but is also found on some of the trap dykes. Its location, however, must be dry and sterile.

On the granite ridge at an altitude of six hundred feet, were found, during the past season, two interesting milkworts, *Polygala Nuttallii*, Torr. & Gray, and *P. verticillata*, var. *ambigua*, Wood. Both were growing by the roadside in damp, sandy soil and in open grass land. So far as known this is the first time that either of these species has been reported as growing in Connecticut.

The mountain mint, *Pycnanthemum muticum*, Pers., is here found only in granite soil, and the same can be said of the grass, *Sporobolus serotinus*, Gray, and the white cedar, *Chamaecyparis sphaeroides*, Spach.

Among escapes, which are well established, mention might be made of the Jersey pine, *Pinus inops*, Ait., growing in hard, rocky trap soil, and *Ptelea trifoliata*, L., found along fence-rows.

Centaurea Jacea, L., *Berteroa incana* DC., *Silene dichotoma*, Ehrh., *Amsinckia lycopsoides*, Lehm., and *Picris echioides*, L., are recent introductions, but also well established.

Southington, Conn.

RHODE ISLAND PLANT-NOTES, — II.

J. Franklin Collins.

All the plants in the accompanying list are, unless otherwise noted, to be regarded as hitherto unrecorded for the state, and as collected in Providence, or its immediate vicinity, by the writer. All the grasses — with but a single exception — have been examined (or determined) by botanists of the Division of Agrostology at Washington. The greater portion of all the species are represented by specimens in the writer's herbarium, and most of those not so represented are to be found in the Brown University Herbarium.

Botrychium ternatum, Swz., and its var. *rutaefolium*, — as characterized in Gray's Manual.

Pellaea atropurpurea, Link. Lincoln (*G. H. Leland*).

Lycopodium inundatum, L. Frequent in low or damp fields, Providence county. Previously collected at Block Island.[1]

Sparganium simplex androcladum, Engelm. (*S. androcladum*, Morong). Wet roadsides and bogs, Providence, Cranston, Warwick.

Alisma Plantago, L. Common. Leaves from oval or oblong to broadly ovate-cordate (including the previously recorded var. *Americanum*).

Sagittaria Engelmanniana, J. G. Smith (*S. variabilis* var. (?) *gracilis* Engelm.). Providence (?), Lincoln.

Panicum Columbianum, Scribn. Low, moist ground.

P. barbulatum, Mx. N. Kingstown (*Bennett*, 1858), Providence (*J. F. C.*, 1890).

P. implicatum, Scribn. Providence (*Bennett*, 1855).

P. nitidum, Lam. Sandy shores, E. Providence.

Stipa comata, Trin. & Rupr. (?) Wastes, Pawtucket (*Miss M. L. McCudden*).

Sporobolus longifolius (Torr.) Wood. "R. I." (*W. W. Bailey*).

Glyceria fluitans angustata, Vasey (*Panicularia borealis*, Nash). In shallow water.

Lolium temulentum, L. Wastes.

Agropyrum repens agrestis, Anderss. Brackish shores.

Hordeum jubatum, L. Wastes, Cranston (*Mrs. Earle*), Providence (*J. F. C.*).

[1] Bull. Torr. Bot. Club, **20**: 239.

Carex folliculata, L. Common. Omitted from Mr. Bennett's list, though recorded by Mr. Olney in 1846.

C. lupulina pedunculata, Dewey. Providence, Cranston, Block Island.

C. rosea radiata, Dewey. Cumberland.

Lemna Valdiviana, Philippi. Randall's Pond (abundant), Cranston.

Juncus marginatus paucicapitatus, Engelm. Block Island.

J. tenuis secundus, Engelm (*J. secundus*, Beauv). East Providence.

Sisyrinchium angustifolium, Mill. Common in grassy places.

Morus alba, L. Occasionally spreading spontaneously.

Atriplex patula hastata, Gray (*A. hastata L.*). Salt and brackish shores, Block Island, Providence.

Camelina sylvestris, Wallr. Wastes; rare.[1]

Philadelphus coronarius, L. Persisting as an escape at a few stations.

Ribes rubrum subglandulosum, Maxim. (?) In Woods, Providence and E. Providence. Doubtfully native. Possibly an escape of the garden form.

Physocarpus opulifolius, Maxim. Doubtfully native.

Pyrus arbutifolia, L. f. In woods, apparently common in Providence county where it is sometimes 18–20 feet high, with a distinctly treelike appearance. Previously recorded for Block Island.[2]

Rosa humilis, Marsh. Not rare.

R. canina, L. Fields and waste roadsides at a few stations.

Trifolium incarnatum, L. About recently cultivated fields, especially those lately abandoned, Burrillville (*Mrs. J. H. Collins*), Wickford, Cranston. Doubtfully hardy. Reported from Block Island by A. Hollick.[3]

Coronilla varia, L. Portsmouth (*Mrs. S. Pearce*), and a few other stations in southern R. I. Also near Buzzard's Bay, Mass. (*T. J. Battey*).

Lespedeza reticulata, Pers. Frequent in sandy fields.

Ailanthus glandulosa, Desf. Although not very abundant about Providence, this tree seems to thrive and fruit well. It also occurs at

1 Described, and recorded for R. I., in Synop. Fl., **1**: 468 [part 1].

2 Bull. Torr. Bot. Club, **20**: 233.

3 Ann., N. Y. Acad. Sci., **9**: 65.

Bristol and elsewhere; generally in situations suggestive of artificial planting. On Conanicut Island, however, it seems to be spreading spontaneously.

Euonymus atropurpureus, Jacq. Escaped in several places. Apparently not spreading.

Lechea minor, L. Sandy soil.

Viola ovata, Nutt. This hairy, ovate-leaved habitant of the fields and drier woods appears to be the common form, in northern R. I., of what has generally passed as *V. sagittata*, Ait.

Calluna vulgaris, Salisb. Great Swamp, Washington County (*G. W. Burlingame*).

Phlox paniculata, L. Escaped along roadsides, N. Kingstown (*J. T. Smith*), N. Providence, and Conanicut Island (*J. F. C.*).

Galium trifidum pusillum, Gray. This variety seems to be quite generally distributed in the swamps and wet localities of northern R. I.

Solidago sempervirens, L. Recorded by Mr. Olney in 1844, but accidentally overlooked by Mr. Bennett in 1888. It is the commonest seaside golden-rod in the state.

Nine species and seven varieties of *Antennaria* are now recognized as occurring in New England. Of these the five following have been collected about Providence.[1]

A. plantaginea, R. Br. Common.

A. plantaginea petiolata, Fernald. Abundant in dry fields.

A. Parlinii ambigens, Fernald. Apparently rare, so far as known at present.

A. neodioica, Greene. Rather common.

A. neglecta, Greene. Very common.

Artemisia Stelleriana, Bess. Richmond (*G. H. Leland*), Newport (*Mrs. Rogers*), Little Compton (*W. W. Bailey*).

Certain cereals are more or less conspicuous each year, on the wastes, particularly *Avena sativa*, L., *Triticum sativum*, Lam., and its varieties *vulgare* (Ville) Hack., and *muticum*, Hack., *Secale cereale*, L., *Hordeum jubatum*, Jessen., *H. distichon*, L., and *Zea Mays*, L.

PROVIDENCE, R. I.

[1] M. L. Fernald in Proc. Boston Soc., Nat. Hist., **28**: 237 (1898).

HYDNUM CAPUT-MEDUSAE.

Hollis Webster.

Hydnum Caput-Medusae is a fungus apt to be conspicuous in the minds of those newly attracted to observe and collect our fleshy fungi. Its name has a definite suggestiveness, it belongs to a genus readily recognized, and it is pictured or described in popular accounts as such a remarkable and fascinating object that every true fungus-hunter longs to find it, photograph it, possess it, exhibit it, and even, it may be, to eat it. That such a desire (in which the writer may admit his share) is prevalent and determined, is evident from the numerous reports that go about every season of the finding of the Medusa hydnum, and from the frequent despatch to the centres of information of specimens so labeled. Unfortunately for the satisfaction of ardent collectors, it is only too probable that they are in most cases deceived; ten to one, at least, they have something else. Hence, it is by way of warning against such a common mistake that attention is here called to certain other species which are the innocent cause of it.

If the reader will turn to Stevenson's British Fungi, or to Massee's British Fungus Flora, he will find described along with this species, two others somewhat similar, *H. coralloides* (Coral hydnum) and *H. Erinaceus* (Hedgehog hydnum), and if he will examine also plate seven of the first volume of Fries's Icones and the accompanying description (p. 9), he will learn details of a fourth species, *H. Caput-ursi* (Bear's-head hydnum) even more like his probable notion of *H. Caput-Medusae*.[1] All of these four species are large, white, and provided abundantly with long fleshy spines, and all, except the Coral hydnum, generally have a firm, fleshy body. No exhaustive description of them need be given here, it being the writer's intention mainly to awaken, in the minds of uninformed readers, a feeling of uncertainty that will be banished only by a careful study of the details given in the references mentioned. Still, it may be well to point out that the Coral hydnum is fairly distinct by reason of its comparatively delicate branching habit. Of the others, the Hedgehog hydnum is not at all branched but is tuberculose and has very long spines, and is somewhat lacerate fibrillose above; the Medusa hydnum is also unbranched,

[1] See also C. H. Peck, Report of the State Botanist of New York for 1897. Pp. 310, 311,

is tuberculiform, has long spines, though shorter than those of the last, and finally, as the name would indicate, has a suggestion of the Gorgon locks in the distorted character of the upper spines; the Bear's-head hydnum, which has a tubercular body like the last two, differs, as is easily seen in section, by being covered with short branching processes from which the spines depend.

In Fries's descriptions some prominence is given to the statement that *Hydnum Caput-Medusae* turns smoky or ashen with age, and not dingy yellowish or brown like the others, but it must be remembered that he admits that up to the time of the publication of his Hymenomycetes Europaei (1874), he had seen only a plate of this species. The others he knew in their growing state, and *H. Caput-ursi* is a species of his own making.

All four species are found in this country, but that the Medusa hydnum is not common is plain from the following remarks which the writer is permitted to quote from a letter from Professor Peck: "You correctly surmise that I have received specimens of *Hydnum coralloides* and *H. Caput-ursi* from correspondents who took them to be *H. Caput-Medusae.* I have never seen typical specimens of this species from this country, but I have received from western New York and from Missouri, specimens that might be referred to it by some, since the agreement was very good except in color. They had spines on the upper surface, that by a little stretch of the imagination might be called 'contorted,' though they really were merely wavy or flexuous. In no case have these, or any others that have come to me, shown any dingy gray or sooty cinereous color, and, as they have indicated a somewhat 'ramose-cancellate' structure within, I have considered them only a variation of *H. Erinaceus*. . . . In the fifty-first report, which I expect will soon be issued [January, 1899] I have given a figure of *H. Caput-ursi*, as it occurs in our state. I have thought it desirable to do so in order to correct the too prevalent false notions concerning it as well as to illustrate our edible species."

Enough has been said to show that *Hydnum Caput-Medusae*, however definitely imagined, is by no means easily discovered or determined when found. It may justly be inferred, moreover, that distinctions between it and others are not too well known. It is none the less deserving or attractive as an object of search. On the contrary there is offered to every observer the interesting problem of straightening out the difficulties of the case for himself, and of making abundant

collections and careful studies to this end. Unless this plan is followed, the hydnum with the Gorgon locks is likely to remain for most of us in more senses than one a mythical plant.

On some variations of Spiranthes cernua.—During the last week of September, 1898, I noted in an alluvial meadow in Williamstown, Massachusetts, some variations of the common *Spiranthes cernua,* which, so far as I am aware, have never been recorded. The observations I was then able to make showed that there exist apparently three fairly distingishable forms of this plant.

The alluvial meadow where these observations were made is bordered on one side for a distance of about half a mile by a swamp. On visiting the locality the past fall I noticed that the plant growing rather profusely along the edge of the swamp differed in some notable points from the *Spiranthes cernua* with which I was hitherto familiar. The most obvious difference was that of color. The ordinary *S. cernua,* as I have found it in various parts of this, as well as other regions, is a pure white, or very nearly so, but the present form was a very pronounced yellow or cream-color. In this yellow form the rich fragrance of the ordinary white plant was invariably lacking; and the lip of the flower was shorter, broader, and more rounded, or in some cases almost two-lobed. The leaves also appeared quite distinct, both in shape and structure. The plant appearing through the whole meadow was the yellow form. There were, however, confined to a small area of a few square rods, a few specimens of the ordinary white fragrant form, and some distance away there was a similar area of an apparently intermediate plant, white-flowered, but without fragrance, and with all the other characteristics of the yellow-flowered form. Each type was confined to its own area, and, so far as observed, the characters of each seemed fixed. Further observations are needed, however, to establish this point, for, unfortunately, I was not able at the time to examine the plants more in detail.

I have very recently learned that similar observations on this species have been made about Manchester, New Hampshire, by Mr. F. W. Batchelder, and on Mount Desert Island, by Mr. E. L. Rand, and it is hoped that others may bear in mind this variation during the coming fall. — A. LeRoy Andrews.

The listeras of New England. — In a recent study of the genus *Listera* (Bull. Torr. Cl. xxvi, 157-171, pl. 356, 357), Dr. Karl M. Wiegand defines for New England three species, the well-known *L. cordata*, R. Br., examined from Maine, New Hampshire, Vermont and Rhode Island; *L. convallarioides*, Torr., from Maine, New Hampshire, and Vermont; and a novel but characteristic plant, which differs from *L. convallarioides* in having the oblong lip not dilated above nor contracted below, and in bearing near the base two incurved auricles. This species, *L. auriculata*, Wiegand, occurs in mossy woods or on damp wooded banks from the White Mountains through central and northern Maine and northward to Quebec and Lake Temiscouata. In Maine, where it is apparently as abundant as *L. convallarioides*, it usually flowers in late June, about ten days earlier than that species. — M. L. Fernald.

THE LOCAL FLORAS OF NEW ENGLAND.

Mary A. Day.

It is difficult to define the precise scope of the term local flora. The descriptive manual passes insensibly into the annotated list, which in its turn merges into mere collections of observations upon selected species. It is impossible to say at what point such papers cease to merit the title of floras or even of lists; since in indexing and bibliography it is generally best to err on the side of fulness, many short and popular lists are here mentioned. With the exception of papers on the willows, no list dealing only with a group of lower order than a family is included. Works which cover not only New England, but other regions also are usually omitted.

The most complete previously published catalogue of New England floras is that included in Prof. N. L. Britton's List of state and local floras of the United States and British America,[1] in which 106 papers are credited to New England — a number more than doubled in the present compilation, which comes down to January 1, 1899.

Some experimentation in classifying the works here enumerated has led to the conclusion that nearly all of them fall readily into two categories, namely: I. Those which aim at completeness in their

[1] Ann. N. Y. Acad. Sci. v., Apr., 1890.

chosen field, *e. g.*, Flint, W. F., New Hampshire grasses. II. Those works which merely enumerate, with or without notes, certain selected species of a particular area, making no pretension to be exhaustive or even to cover completely any especial family. The first category can be subdivided into four classes of works, *viz.*, (*a*) Descriptive manuals, *e. g.*, Farlow, W. G., Marine Algae of New England, containing diagnoses of the plants they mention; (*b*) annotated catalogues, *e. g.*, Dame and Collins, Flora of Middlesex County, in which the scientific names are accompanied by remarks upon occurrence, habitat, season of flowering, or other notes including perhaps occasional diagnoses; (*c*) lists or mere enumeration of species without significant notes or descriptions; (*d*) keys, *e. g.*, Knobel, E., Ferns and evergreens of New England, in which, with little or no descriptive text a brief determinative synopsis is given. Works of the second category may be generally divided into (*e*) those in which the selected species receive a technical or scientific treatment, *e. g.*, Setchell, W. A., Notes on some Cyanophyceae of New England; and (*f*) those in which the treatment is popular, *e. g.*, Bailey, W. W., New England wild flowers. In order to give as briefly as possible a clue to the nature of the papers enumerated these six classes are indicated by the following condensed expressions: Descr. manual, Annot. catalog., List, Key, Select. spec., technic. treatm., Select. spec., popular treatm.

It was hoped to include in the present catalogue mentions of local floras now in preparation, but as most authors have shown a natural reluctance to announce beforehand undertakings which they may not be able to complete, it has seemed best to omit this feature of the work. It has also been found impracticable to state prices and sources of supply, since with few exceptions the floras here mentioned have long been out of print and can only be picked up at second hand.

All but seven of the papers here enumerated have been personally examined by the compiler. Where no other library is mentioned the work is to be found in the Library of the Gray Herbarium of Harvard University, Cambridge, Mass. The following abbreviations indicate the other libraries where particular papers may be consulted: H. C., Harvard College; N. H., Boston Society of Natural History; M. H., Massachusetts Horticultural Society; B. P., Boston Public Library; B. A., Boston Athenaeum; E. I., Essex Institute, Salem.

The writer cordially acknowledges assistance from various members of the New England Botanical Club, who by suggestions and informa-

tion have contributed to the completeness of the catalogue. Information as to papers omitted will be welcomed, and if of sufficient importance will be included in a supplementary list.

GRAY HERBARIUM.

NEW ENGLAND.

General works: —

1. **Bailey, William Whitman.** NEW ENGLAND WILD FLOWERS AND THEIR SEASONS. Providence, R. I., 1897, pp. 150. Select. spec., popular treatm. *phaenog.* and *vasc. cryptog.*

2. —— OUR POISONOUS PLANTS. Am. Nat. vii. 1873, pp. 4–13. Illus. Select. spec., popular treatm. *phaenog.*

3. **Baldwin, Henry.** THE ORCHIDS OF NEW ENGLAND. A POPULAR MONOGRAPH. N. Y. 1884, pp. 158. Illus. Descr. manual. *phaenog.*

4. **Collins, Frank Shipley.** NOTES ON NEW ENGLAND ALGAE I–VII., Bull. Torr. Club, ix. 1882, pp. 69–71; x. 1883, pp. 55–56; xi. 1884, pp. 29–30, 130–132; xviii. 1891, pp. 335–341; xxiii. 1896, pp. 1–6, 458–462. Select. spec., technic. treatm. *cryptog.*

5. **Cutler, Manasseh.** AN ACCOUNT OF SOME OF THE VEGETABLE PRODUCTIONS NATURALLY GROWING IN THIS PART OF AMERICA, BOTANICALLY ARRANGED. Mem. Am. Acad. i. 1785, pp. 396–493. Select. spec., technic. treatm. *phaenog.*

   Oldest systematic botanical work of New England.

6. **Deane, Walter.** THE NATIVE ORCHIDS OF NEW ENGLAND. Am. Gard. xii. 1891, pp. 152–157. Illus. Select. spec., popular treatm. *phaenog.*

7. **Dodge, Raynal.** THE FERNS AND FERN ALLIES OF NEW ENGLAND. Binghamton, N. Y. 1896, pp. 51. Illus. Descr. manual. *cryptog.*

8. **Farlow, William Gilson.** LIST OF SEA-WEEDS OR MARINE ALGAE OF THE SOUTH COAST OF NEW ENGLAND. Rep. U. S. Fish Comm. 1871–72, pt. 1, pp. 281–284. Annot. catalog. *cryptog.* N. H.

9. —— MARINE ALGAE OF NEW ENGLAND AND ADJACENT COAST. Washington, 1881, pp. 210. Illus. Reprint from U. S. Fish Comm. 1879. Descr. manual. *cryptog.*

10. —— NOTES ON COLLECTIONS OF CRYPTOGAMS FROM THE HIGHER MOUNTAINS OF NEW ENGLAND. Proc. Bost. Soc. Nat. Hist. xxv. 1892, pp. 387–391. Select spec., popular treatm. *cryptog.*

11. **Frost, Charles Christopher.** CATALOGUE OF BOLETI OF NEW ENGLAND, WITH DESCRIPTIONS OF NEW SPECIES. Bull. Buffalo Soc. Nat. Sci. ii. 1874, pp. 100–105. Annot. catalog. *cryptog.*

12. **Frost, Charles Christopher.** Further enumeration of New England Fungi. Proc. Bost. Soc. Nat. Hist. xii. 1868, pp. 77–81. List. *cryptog.* N. H.

13. **Josselyn, John.** New England rarities discovered. With introduction and notes, by Edward Tuckerman. n. d. pp. 134. Select. spec., popular treatm. *phaenog.*

This work was originally published in London in 1672. pp. 113.

14. **Knobel, Edward.** Ferns and evergreens of New England. Boston, 1895. Illus. Key. *vasc. cryptog.*

15. —— A guide to find the names of all wild-growing trees and shrubs of New England, by their leaves. Boston, 1894. Illus. Key. *phaenog.*

16. **Oakes, William.** Notice of some rare plants of New England, with description of some new species. Hovey's Mag. vii. 1841, pp. 178–186. Reprint, pp. 8. Annot. catalog. *phaenog.*

17. —— Notice of some rare plants of New England. Hovey's Mag. xiii. 1847, pp. 217–220. Annot. catalog. *phaenog.*

18. **Sargent, Frederick LeRoy.** Guide to the recognition of the principal orders of cryptogams and the commoner and more easily distinguished New England genera. With a full glossary. Cambridge, 1886, pp. 39. Key to selected genera. *cryptog.*

19. **Setchell, William Albert.** Notes on some Cyanophyceae of New England. Bull. Torr. Club, xxii. 1895, pp. 424–431. Select. spec., technic. treatm. *cryptog.*

20. **Sprague, Charles James.** Contributions to New England mycology. Proc. Bost. Soc. Nat. Hist. v. 1856, pp. 325–331; vi. 1858, pp. 315–321. List. *cryptog.* N. H.

21. **Tuckerman, Edward.** Descriptions of several new plants of New England. Hovey's Mag. ix. 1843, pp. 142–145. Select. spec., technic. treatm. *phaenog.* and *vasc. cryptog.*

22. —— Enumeration of some Lichenes of New England with remarks. Bost. Jour. Nat. Hist. ii. 1839, pp. 245–262; iii. 1840, pp. 281–306, 438–464. Select. spec., technic. treatm. *cryptog.* N. H.

23. —— A further enumeration of some alpine and other Lichenes of New England. Bost. Jour. Nat. Hist. v. 1845, pp. 93–104. Select spec., technic. treatm. *cryptog.* N. H.

24. —— Observations on some interesting plants of New England. Am. Jour. Sci. xlv. 1843, pp. 27–49. Select. spec., technic. treatm. *phaenog* and *vasc. cryptog.*

25. —— Observations on some New England plants with characters of several new species. Am. Jour. Sci. ser. 2, vi. 1848, pp. 224–232. Select. spec., technic. treatm. *phaenog.*

MAINE.

General Works:—

26. **Cooke, Mordecai Cubitt.** DECADES OF MAINE FUNGI. Proc. Portland Soc. Nat. Hist. i. 1869, pp. 179–185. Illus. Select., spec., technic. treatm. *cryptog.*

27. **Fernald, Charles Henry.** THE GRASSES OF MAINE. DESIGNED FOR THE USE OF STUDENTS IN THE MAINE STATE COLLEGE, AND THE FARMERS OF THE STATE. Augusta, 1885, pp. 70. Illus. Annot. catalog. *phaenog.*

28. **Fernald, Merritt Lyndon.** THE PORTLAND CATALOGUE OF MAINE PLANTS. ed. 2. Proc. Portland Soc. Nat. Hist. ii. 1892, pp. 41–72. List.

—— SUPPLEMENT. Proc. Portland Soc. Nat. Hist. ii. 1895, pp. 73–96. Annot. catalog.

—— SECOND SUPPLEMENT. Proc. Portland Soc. Nat. Hist. ii. 1897, pp. 123–137. Annot. catalog. *phaenog.* and *vasc. cryptog.*

For ed. 1., see Goodale, G. L. and Blake, J.

29. **Goodale, George Lincoln.** BOTANICAL NOTES ON THE NEW LANDS. 6th Ann. Rep. Sec. Board Agric. Maine, 1861, pt. 2, pp. 361–372; or Prelim. Rep. Nat. Hist. and Geol. Maine, 1861, pp. 361–372. Illus. Select. spec., popular treatm. *phaenog.*

30. —— BOTANICAL REPORT [CONTAINING A BRIEF CATALOGUE OF THOSE PLANTS WHICH HAVE NOT AS YET BEEN CREDITED TO MAINE]. 6th Ann. Rep. Sec. Board Agric. Maine, 1861, pt. 2, pp. 125–129; or Prelim. Rep. Nat. Hist. and Geol. Maine, 1861, pp. 128–129. Annot. cat. *phaenog.* and *vasc. cryptog.*

31. —— A CATALOGUE OF THE FLOWERING PLANTS OF MAINE. Proc. Portland Soc. Nat. Hist. i. 1862, pp. 37–63, 1869, pp. 127–138. List. *phaenog.* and *vasc. cryptog.*

Cyperaceae & Gramineae by Joseph Blake.

32. —— **and Blake, Joseph.** PORTLAND CATALOGUE OF MAINE PLANTS, PUBLISHED BY THE PORTLAND SOCIETY OF NATURAL HISTORY, ADAPTED FOR MARKING DESIDERATA IN EXCHANGE OF SPECIMENS, ETC. Portland, 1868, pp. 12. List. *phaenog.* and *vasc. cryptog.*

For ed. 2, see Fernald, M. L.

33. **Harvey, Francis LeRoy.** CONTRIBUTIONS TO THE CHARACEOUS PLANTS OF MAINE. I. Bull. Torr. Club, xxii. 1895, pp. 397–398. Select. spec., technic. treatm. *cryptog.*

34. —— CONTRIBUTIONS TO THE GASTEROMYCETES OF MAINE. Bull. Torr. Club, xxiv. 1897, pp. 71–74. Select. spec., technic. treatm. *cryptog.*

35. **Harvey, Francis LeRoy.** Contributions to the lichens of Maine. i–ii. Bull. Torr. Club, xxi. 1894, pp. 389–393; xxiii. 1896, pp. 7–10. Select. spec., technic. treatm. *cryptog.*

36. —— Contribution to the myxogasters of Maine. i–ii. Bull. Torr. Club, xxiii. 1896, pp. 307–314; xxiv. 1897, pp. 65–71. Select. spec., technic. treatm. *cryptog.*

37. —— Contribution to the Pyrenomycetes of Maine. i. Bull. Torr. Club, xxiii. 1896, pp. 50–58. Select. spec., technic. treatm. *cryptog.*

38. —— The fresh water Algae of Maine. i–iii. Bull. Torr. Club, xv. 1888, pp. 155–161; xvi. 1889, pp. 181–188; xix. 1892, pp. 118–125. Select spec., technic treatm. *cryptog.*

39. —— Notes on Maine plants. Bull. Torr. Club, xix. 1892, p. 340; xxiii. 1896, pp. 275–276; xxiv. 1897, pp. 50–51; xxv. 1898, pp. 210–211. Select spec., technic. treatm. *phaenog.*

40. —— **and Briggs, Fred Percy.** A contribution to the phaenogams and vascular cryptogams of Maine. Bull. Maine State College Lab. Nat. Hist. i. no 2, pt. 2, 1893. Reprint, 1893, pp. 13. List. *phaenog.* and *vasc. cryptog.*

41. **Mansfield, Frank Albert.** List of new Maine plants. The Home Farm. Augusta, Oct. 22, 1881. Reprint. Suppl. list. *phaenog.*

42. **Scribner, Frank Lamson.** The ornamental and useful plants of Maine. Affording popular descriptions and practical observations on the habits, properties, uses and best methods of propagation and culture, of nearly all the ornamental and useful plants found native in the state. 19th Ann. Rep. Sec. Maine Board Agric. 1874, pp. 157–237. Reprint, 1875. pp. 85. Illus. Select. spec., popular treatm. *phaenog.*

43. —— Weeds of Maine. 14th Ann. Rep. Sec. Maine Board Agric. 1869, pp. 239–292. Illus. Reprint, 1869, pp. 62. Annot. catalog. *phaenog.*

44. **Thoreau, Henry David.** [List of plants noticed in the Maine woods in the years 1853 and 1857.] In his The Maine Woods, 1864, pp. 312–320. Annot. list. *phaenog.* and *vasc. cryptog.* H. C.

45. **West, William.** The desmids of Maine. Jour. Bot. xxvi. 1888, pp. 339–340. Annot. catalog. *cryptog.*

46. —— The fresh-water Algae of Maine. Jour. of Bot. xxvii. 1889, pp. 205–207; xxix. 1891, pp. 353–357. Annot. list. *cryptog.*

47. **Williamson, William Durkee.** The native vegetables. In his history of the state of Maine. i. 1832, pp. 105–131. Select spec., popular treatm. *phaenog.* H. C.

Aroostook County: —

48. **Furbush, Kate.** A botanist's trip to "The Aroostook." Am. Nat. xv. 1881, pp. 469–470; xvi. 1882, pp. 397–399. Select. spec., popular treatm. *phaenog.* and *vasc. cryptog.*

Cumberland County: —

49. **Cushing, Harold Beveridge.** The wild flowers of Cushing's Island, Maine. Bot. Gaz. xxv. 1898, pp. 353–357. Select. spec., popular treatm. *phaenog.*

50. **Kemp, Alex. F.** On the shore zones and limits of marine plants on the northeastern coast of the United States. Can. Nat. and Geol. vii. 1862, pp. 20–34. Select. spec., popular treatm. *cryptog.* B. P.

Franklin County:—

51. **Jewell, Herbert Winship.** Franklin County flora. Part. i. Farmington, Me. 1898, pp. 15. Annot. catalog. *phaenog.*
Arranged by months from May to September.

Hancock County: —

52. **Aubert, Alfred Bellamy.** Liste partielle des Diatomées de Somesville, Seal Harbor, et Northeast Harbor, État du Maine, U.S.A. Le Diatomiste, ii. 1894, pp. 140–143. List. *cryptog.* Not seen.

53. **Rand, Edward Lothrop.** Our island flora. Mount Desert Herald, June 27, 1890. Select spec., popular treatm. *phaenog.* Mr. Rand's library.

54. —— Our island plants. Mount Desert Herald, July 25, Aug. 1, 22, 29, Sept. 5, 1890. Select. spec., popular treatm. *phaenog.* Mr. Rand's library.

55. —— A preliminary list of the phaenogams and vascular cryptogams of Mt. Desert Island, Maine. 1888. Supplement, 1889. 2d Supplement, 1890. 3d Supplement, 1891. 4th Supplement, 1892. Hectograph copy. Annot. catalog. *phaenog.* and *cryptog.*

56. —— Summer flowers at Mount Desert. Mount Desert Herald, Aug. 8, 15, 1890. Select. spec., popular treatm. *phaenog.* Mr. Rand's library.

57. —— **and Redfield, John Howard.** Flora of Mt. Desert Island, Maine. A preliminary catalogue of the plants growing on Mt. Desert and the adjacent islands. With a geological introduction by William Morris Davis, and a new map of Mt. Desert Island. Cambridge, 1894, pp. 286. Map. Annot. catalog. *phaenog* and *cryptog.*

58. **Wasson, Samuel.** Weeds of Hancock. Ann. Rep. Agric. Soc. Maine, 187–778, pp. 236–238. Bound with 22d Ann. Rep. Sec. Maine Board Agric., 1877, pt. 2. Annot. catalog. *phaenog.* M. H.

Penobscot County:—

59. **Aubert, Alfred Bellamy.** Liste partielle des Diatomées d'Orono, Maine, U. S. A. Le Diatomiste, ii. 1895, pp. 150–151. List. *cryptog.* Not seen.

60. **Fernald, Merritt Lyndon.** Plants of special interest collected at Orono, Maine. Bull. Torr. Club, xviii. 1891, pp. 120–124. Select. spec., technic. treatm. *phaenog.* and *cryptog.*

61. **Scribner, Frank Lamson.** A sketch of the flora of Orono, Me. Bot. Gaz. xvi. 1891, pp. 228–234. Select. spec., popular treatm. *phaenog.*

Piscataquis County:—

62. **Aubert, Alfred Bellamy.** Diatomées du mont Ktaadn (Katahdin). Le Diatomiste, ii. 1895, p. 211. List. *cryptog.* Not seen.

63. **Bailey, Jacob Whitman.** Account of an excursion to Mt. Katahdin in Maine. Am. Jour. Sci. xxxii. 1837, pp. 20–34. Selec. spec., popular treatm. *phaenog.* and *vasc. cryptog.*

64. **Briggs, Fred Percy.** Plants collected on Mt. Ktaadn, Me., August, 1892. Bull. Torr. Club, xix. 1892, pp. 333-336. Partial list. *phaenog.* and *vasc. cryptog.*

65. **Scribner, Frank Lamson.** Mt. Kataadn and its flora. Bot. Gaz. xvii. 1892, pp. 46–54. Annot. catalog. *phaenog.* and *vasc. cryptog.*

Somerset County:—

66. **Harvey, Francis LeRoy, and Knight, Ora Willis.** Cryptogams collected near Jackman, Maine, August, 1895. Bull. Torr. Club, xxiv. 1897, pp. 340–342. Select. spec., technic. treatm. *cryptog.*

Waldo County:—

67. **Lang, J. W.** List of trees and shrubs common to Waldo County. 18th Ann. Rep. Sec. Maine Board Agric. 1873, pp. 247–249. Annot. catalog. *phaenog.* H. C.

Washington County:—

68. **Aubert, Alfred Bellamy.** Diatoms found in a fresh water deposit from Jonesport, Maine. Am. Month. Micros. Jour. xvii. 1896, pp. 165–166. List. *cryptog.* N. H.

69. **Eaton, Daniel Cady.** List of Marine Algae collected near Eastport, Maine, in August and September in 1873 in connection with the work of the U. S. Fish Commission under Prof. S. F. Baird. Trans. Conn. Acad. Arts & Sci. ii. pt. 2, 1873, pp. 343–350. Select. spec., popular treatm. *phaenog.* and *cryptog.*

70. **X.** Some remarks on the botany, &c., of Eastport, Me., and its vicinity. Hovey's Mag. x. 1844, pp. 405–410. Select. spec., popular treatm. *phaenog.* and *cryptog.*

York County:—

71. **Chickering, John White.** Field notes in New England. Field & Forest, ii. 1876, pp. 43–44. Select. spec., popular treatm. *phaenog.*

New Hampshire.

General Works:—

72. **Belknap, Jeremy.** Forest trees and other vegetable productions [of N. H.]. In his History of New Hampshire, iii. 1792, pp. 96–127. Annot. catalog. *phaenog.* H. C.

"For the arrangement of several articles in the botanical and zoölogical chapters, for their generic and specific names, and for some of the observations on their nature and properties, I am indebted to the friendly assistance of the Rev. Manasseh Cutler, of Ipswich, and Mr. William Dandridge Peck, of Kittery."

73. **Flint, William F.** The distribution of plants in New Hampshire. In Hitchcock, C. H. Geology of N. H., pt. 1, 1874, pp. 381–415. List. *phaenog* and *vasc. cryptog.* H. C.

74. —— New Hampshire grasses. 8th Ann. Rep. Board Agric., N. H. 1878, pp. 281–307. Annot. catalog. *phaenog.* B. P.

75. —— Trees and shrubs composing the New Hampshire forests. Their distribution, relative abundance and utility. Rep. For. Comm. N. H. 1885, pp. 30–73. Reprint, Manchester, 1891, with introductory note by Henry G. Jesup. Annot. catalog. *phaenog.* H. C.

76. **Hastings, William N.** New desmids from New Hampshire, I. Am. Month. Micros. Jour. xiii. 1892, pp. 153–155. Illus. Annot. catalog. *cryptog.* N. H.

Cheshire County:—

77. **Deane, Walter.** The flora of the summit of Mt. Monadnock, N. H., in July. Bull. Torr. Club, xvii. 1890, pp. 316–318. Select. spec., popular treatm. *phaenog.*

78. **Stone, William H.** The flora of Mt. Monadnock. Appalachia, iv. 1884–86, pp. 145–150. Select. spec., popular treatm. *phaenog.* N. H.

Coös, Carroll, and Grafton Counties (White Mountain Region) : —

79. **Bailey, William Whitman.** Notes from Franconia. Bot. Gaz. viii. 1883, pp. 157–159. Select. spec., popular treatm. *phaenog.*

80. —— Notes from Mt. LaFayette, N. H. Bot. Gaz. vii. 1882, pp. 108–109. Select. spec., popular treatm. *phaenog.*

81. —— Notes on the plants found in the Franconia Valley and on Mts. LaFayette and Kinsman, July and August, 1882. Appalachia, iii. 1882–84, pp. 169–175. Select. spec., popular treatm. *phaenog.* and *vasc. cryptog.* N. H.

82. **Barratt, J.** List of plants collected by E. W. Southwick on the White Mountains of New Hampshire, July 15, 1841, with notes and references. From the Classic. Not seen.

83. **Bebb, Michael Schuck.** White Mountain willows. i – iv. Bull. Torr. Club, xv. 1888, pp. 121–128 ; xvi. 1889, pp. 39–42, 211–215 ; xvii. 1890, pp. 149–151. Illus. Annot. catalog. *phaenog.*

84. **Bigelow, Jacob.** Some account of the White Mountains of New Hampshire. N. E. Jour. Med. and Surg. v. 1816, pp. 320–338. Select. spec., popular treatm. *phaenog.* and *cryptog.* H. C.

85. **Chickering, John White.** Catalogue of the alpine and sub-alpine flora of the White Mountains of N. H. Field & Forest, ii. 1876, pp. 98–99. List. *phaenog.* and *vasc. cryptog.*

86. —— White Mountain notes. Field & Forest, i. 1875, pp. 37–38. Select. spec., popular treatm. *phaenog.*

87. **Farlow, William Gilson.** Notes on the cryptogamic flora of the White Mountains. Appalachia, iii. 1884, pp. 232–251. Select. spec., technic. treatm. *cryptog.*

88. **Hitchcock, Charles Henry.** Canadian plants naturalized on Mt. Washington. In his Geology N. H. i. 1874, pp. 572–573. List. *phaenog.* and *vasc. cryptog.* H. C.

89. —— List of plants found in New Hampshire only on alpine summits. In his Geology N. H. i. 1874, pp. 571–572. List. *phænog.* and *vasc. cryptog.* H. C.

90. **Huntington, John Henry.** Flowering plants of the White Mountains. Appalachia, i. 1877, pp. 100–106. Reprint, pp. 8. Annot. catalog. *phaenog.* M. H.

(To be continued.)

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TO SEAWEED COLLECTORS.

F. S. Collins.

Among the great number of persons, who, within the next three months, will make a longer or shorter stay at points on the New England coast, there are undoubtedly many who have seen and admired collections of algae, and have hoped, when they had the opportunity, to make a collection for themselves. But it is probable that without some advice as to where and how to collect, and how to determine the plants collected, in most cases little will be accomplished. With a view to giving some little assistance in these matters, the writer would call attention, first, to the books in which our New England seaweeds are described; second, to some of the richer and more interesting localities; and third, to some species, which are known only from one, or at most two localities, and in regard to which any further information would be a real addition to our knowledge.

The first great contribution to the literature of American algology, and the foundation for all subsequent work, is the Nereis Boreali-Americana of W. H. Harvey, published in three parts in the Smithsonian Contributions to Knowledge for the years, 1852, 1853 and 1857. It is a quarto, with fifty colored plates, and covers all the species known, at the time of its issue, to occur in the United States. Though the government supply was long since exhausted, a copy can frequently be obtained from the dealers who make a specialty of botanical works.

The next work of importance is the Manual of the Marine Algae of New England, by W. G. Farlow, originally published as a supplement to the Report of the United States Fish Commission for 1879, and as a separate work in 1881. It bears the same relation to the New England marine flora that Gray's Manual does to the flowering plants of

the eastern States, and is absolutely necessary for any thorough study. A more popular book, published in the same year, is Sea Mosses, by A. B. Hervey; many of our more conspicuous algae can easily be recognized by it, but it does not attempt to give the rarer species. In the eighteen years since these two books were published, there has been a long list of additions to the marine flora of this region; the larger part of the species are insignificant in appearance or quite microscopical, but there is also a number of more conspicuous forms. These additions will be found in notes published by Professor Farlow and by the writer, in the Bulletin of the Torrey Botanical Club.[1] This practically completes the list of available publications, except as algae are included with other plants in local floras.[2]

It seems hardly necessary to give detailed instructions as to collection and preparation of specimens, as each of the three authors first mentioned, Harvey, Farlow and Hervey, gives these quite fully in the works cited. The same information may be found in The Botanical Collector's Handbook, by W. W. Bailey; and in Erythea for March, 1899, Vol. VII, Prof. W. A. Setchell has published a most useful paper, especially intended for Californian collectors, but of value in all regions. A few concise general notes may, however, not be out of place here.

Collect as perfect specimens as possible; when the plant is found growing, retain the "holdfast" by which it is attached. Whenever practicable, collect specimens in fruit. Avoid immature, mutilated and decaying individuals; though when a plant is new or very rare, any specimen is better than none. Mount as soon as possible after collecting, and always keep in salt water; many species spoil in a very short time, and fresh water is sometimes instant ruin.

When ready to mount, float out the specimens in some large vessel of clean salt water; remove any dirt or foreign bodies; when the plant is too densely branched, trim as needed. Let the specimen assume its natural form in the water; if fresh it will do so readily; slide under it a paper of suitable size, lift so that when taken from the water the

1 Vol. IX, pp. 67 and 69, 1882; Vol. X, p. 55, 1883; Vol. XI, pp. 29 and 130, 1884; Vol. XVI, p. 1, 1889; Vol. XVIII, p. 335, 1891; Vol. XXIII, pp. 1 and 458, 1896.

2 The more important of these are, M. L. Owen, Flora of Nantucket, 1888; Dame & Collins, Flora of Middlesex County, Mass., 1888; Rand & Redfield, Flora of Mount Desert Island, Maine, 1894.

plant will remain on it, in the same shape it had in the water. Place the paper on a sloping board to drain for a short time; then lay on drying paper, specimen up; when no more specimens can be placed on the drier, cover all very carefully with a cotton cloth of the same size as the drier. Another drier, more specimens, another cloth, and so on indefinitely.

The whole then to be pressed, the same as flowering plants. Driers should be changed after perhaps an hour; then less and less frequently, though oftener than is usual with flowering plants. Cloths should not usually be changed; by reversing the pile, the cloth with all the specimens on it can be readily shifted. Drying paper to be the same as used for flowering plants, the heavier the better; for delicate algae heavy blotting paper is rather better, but more expensive. For mounting paper any sufficiently strong kind can be used; standard herbarium paper is excellent; it can be bought ready cut, in full sheets, half, quarter and eighth sizes, which give all usually needed. Ordinary cotton cloth, preferably rather fine, should be used; old is better than new; worn sheets and pillow-cases are as good as anything that can be had.

When thoroughly dry, most species of algae will adhere firmly to paper; those that continue unattached should be fastened by a little glue.

A special shallow pan, with sheet of perforated zinc for supporting paper and specimen; brushes and needles for arranging the latter (in emergency a hairpin is useful); a water-proof bag hung by a strap over the shoulder; wide-mouth bottles or preserve jars for keeping delicate plants; knives; scrapers; nets; all these are convenient, and will be found described, with other appliances, in the books just named; and any collector will soon invent or adapt such contrivances as best meet his wants.

In taking up the second subject, that of special localities, if we begin at the New York and Connecticut line, we find a shore of sand, gravel and boulders, but no rocky coast. This character continues over practically the whole coast of the mainland till we reach Cohasset, Mass. Almost everywhere in Long Island Sound, plants grow from low-water mark down; great quantities are sometimes washed ashore by a storm, and in any case when an annual matures, it can be found floating. By wading in shallow bays and lagoons, one can get such plants as *Agardhiella tenera*, *Gracilaria multipartita*, and several

species of *Polysiphonia* growing in great quantity and size in summer. The woodwork of the wharves from low water-mark down is often very rich in species and individuals. Harbors like those of Bridgeport and New Haven are excellent hunting grounds; if the former city seems to have the richest flora of all Long Island Sound, it is probably only that it has been so thoroughly studied. Between Bridgeport and New Haven, at Woodmont, is a small rocky ledge, the only point for many miles where collecting in rocky tide pools is practicable.

Though the sandy or gravelly shore continues practically to Boston on the mainland, the island of Rhode Island gives us very different conditions. Bold or overhanging rocks rise from the sea level, often with a sort of terrace at the base, covered at high water, but easily accessible at low tide, and with innumerable rock pools. Newport is perhaps the best collecting ground of all our coast; it has the warm-water flora of southern New England, with every variety of station; salt marsh, lagoon, sandy beach, boulders, steep cliffs, and tide pools at all levels. At the same time there is such an exposure to the full force of the open sea, that even such northern forms as *Laminaria longicruris* and *Alaria esculenta* occasionally are found.

For plants washed ashore, Bathing Beach and Second Beach are excellent localities, and on the island of Conanicut, Mackerel Cove. The tide pools at Sachuest and Easton's Points, below the Cliff Walk, and from there round to the South Shore, give good results; but perhaps the best pools of all are at Beaver Tail, at the south end of Conanicut. It would be hard to imagine a more beautiful sight than the acres of pools here in April and May, with the delicate green *Monostroma pulchrum*, the rich red *Gloiosiphonia capillaris*, the pale olive fronds of young *Laminaria*, and the iridescent *Chondrus*. As the season goes on other species take the places of these, but the rich display continues.

Vineyard Sound is in many ways like Long Island Sound, but a number of new species appear. At Gay Head there is almost always a sea on, and interesting deep-water plants are washed up. Wood's Hole has long been a centre of exploration, but probably is no richer than the Vineyard shore, especially Edgartown harbor, which is good collecting ground at all seasons of the year. The outside of Cape Cod, owing to the shifting sands, is quite barren; the shallow water inside is like Long Island Sound; at Cohasset begins the rocky coast that stretches, with little break, to New Brunswick. In the warm bays at

Quincy and Weymouth we again meet the southern flora, *Grinnellia* and *Dasya* often appearing in summer in the greatest luxuriance. Goose Cove, Gloucester, appears to be the last important outpost of the southern forms, and only comparatively few species reach there.

Nahant is the best known and most easily accessible part of the rocky shore near Boston. At the east end of Little Nahant, at Spouting Horn and at East Point, are abundant pools, similar to those at Newport, but with the northern flora. Swampscott and Marblehead Neck are similar, though hardly so well situated. All Cape Ann is a good region, but at Magnolia Beach many things come ashore, including perhaps the finest *Euthora cristata* found anywhere; and Pigeon Cove has an exposed rocky coast like that of Maine. North of Cape Ann are alternations of sandy stretches, relatively barren, and rocky points, usually good.

Portland gives excellent opportunities for collecting; the outer sides of the islands, especially Peak's Island, are very fertile, as is also the Cape Elizabeth shore. As we go beyond Portland, there is a broader and broader zone of islands, while the mainland is so sheltered that many of the exposed shore plants are no longer to be found there, though abundant on the islands. Mount Desert, however, takes the full force of the sea, and from Seal Harbor to Bar Harbor, wherever the shore is accessible, good collecting can be done. The icy chill of the water here, even in summer, makes a contrast with the warm water of the Vineyard and Nantucket, and the contrast of the two floras is equally striking. Beyond Mount Desert very little collecting of algae has been done, but the flora is probably the same; Eastport, the boundary, is better known, and everything there is much the same as at Mount Desert.

In making up the list for the third part of this note, species of strictly local record, and of whose range more knowledge is desired, only species that might be noticed by the ordinary collector are included. There are many smaller species, of equal botanical interest, that need not be noted here. The following list gives, together with name of the species, the locality, the collectors on whose authority it is recorded, and occasionally some remark.

Antithamnion cruciatum var. *radicans* J. Ag. Wood's Hole, W. A. Setchell.

Arthrocladia villosa (Huds.) Duby. Falmouth, and the Vineyard shore opposite; not rare here in summer, but known on the American coast elsewhere only at North Carolina.

Brachytrichia Quoyii (Ag.) Bornet & Flahault. Only within a few miles of Wood's Hole, especially on the Buzzard's Bay side; probably not native; see Bulletin Torrey Bot. Club, Vol. XVII, p. 175, 1890.

Ceramium Capri-Cornu (Reinsch) Farlow. Bridgeport, Conn., Isaac Holden.

Ceramium pedicellatum J. Ag. Newport, R. I., Mrs. W. C. Simmons.

Derbesia vaucheriaeformis (Harv.) J. Ag. Wood's Hole, W. G. Farlow; Edgartown, M. W. Jernegan.

Dictyosiphon Chordaria Aresch. Newport, R. I., Mrs. W. C. Simmons.

Dictyosiphon Ekmani Aresch. Nahant, F. S. Collins.

Ectocarpus elegans Thuret. Edgartown, M. W. Jernegan.

Ectocarpus lutosus (Harv.) Wood's Hole, W. G. Farlow.

Ectocarpus ovatus Kjellman. Edgartown, Miss Colt and Miss Jernegan.

Elachista stellaris var. *Chordae* Aresch. Falmouth, Mass., F. S. Collins.

Enteromorpha cruciata Collins. Eagle Island, Penobscot Bay, Maine, F. S. Collins.

Enteromorpha torta (Mert.) Reinbold. Eagle Island, Penobscot Bay, Maine, F. S. Collins.

Griffithsia tenuis Ag. Nantucket, L. L. Dame; Waquoit Bay, Mass., F. S. Collins.

Gymnogongrus Griffithsiae (Turn.) Martius. Eastham, Mass., F. S. Collins.

Haplospora globosa Kjellman. Edgartown, Mass., J. D. King.

Isthmoplea sphaerophora (Harv.) Kjellman. Nahant, Mass., F. S. Collins. A station of perhaps five square meters, the only one known in America.

Kallymenia reniformis (Turn.) J. Ag. Revere Beach, Mass., F. S. Collins. Only two fronds.

Litosiphon pusillus Harv. Newport, R. I., Mrs. W. C. Simmons. Perhaps introduced.

Monostroma Groenlandicum, J. Ag. Common at Nahant and Swampscott, but not known elsewhere nearer than Greenland.

Monostroma Vahlii J. Ag. Mystic River marshes, Mass., F. S. Collins; locality now destroyed; occurs at Greenland.

Phaeosaccion Collinsii Farlow. Mystic River marshes and Nahant; also in Greenland.

Phyllitis zosteraefolia Reinke. Magnolia, Mass., Miss C. E. Clarke; also at Newfoundland.

Phyllophora rubens (Good. & Wood.) Grey. Newport, R. I., Mrs. W. C. Simmons. Only a single specimen, and that doubtful; not otherwise known in America; should be carefully looked for.

Polysiphonia vestita J. Ag. Martha's Vineyard, Miss Laura Jernegan. Only a few plants.

Porphyra coccinea, J. Ag. Hampton Beach, N. H., F. S. Collins. A single frond of *Desmarestia aculeata*, washed ashore, covered with the *Porphyra*; not otherwise known in America.

Scaphospora Kingii Farlow. Edgartown, J. D. King.

Sorocarpus uvaeformis Prings. Martha's Vineyard, Miss Colt.

Ulothrix collabens (Ag.) Thuret. Nahant and Swampscott, F. S. Collins.

The writer would be very glad to receive specimens of any of these species from localities other than those named, or, in the case of the rarer ones, from the same localities; and, in general, any species new to our limits, or from points beyond the previous range. As far as practicable, he will be pleased to assist correspondents in determining doubtful forms, with the usual understanding that a specimen of each may be retained, if desired.

POLYEMBRYONY IN OPUNTIA VULGARIS. — A phenomenon of much scientific interest, though of no great frequency, is polyembryony or the production of more than one embryo from a single seed. It occurs in *Opuntia vulgaris*, as described and figured in the Botanical Gazette for April, 1898. The material used in that study was, however, from plants long grown in a botanic garden, and the polyembryony has not yet been observed in plants growing in a wild state. It is possible, though unlikely, that wild plants are not polyembryonic, and it is desirable that observations upon the point be made in the field. As the species occurs in New England, some of our botanists may have opportunity to study it this summer. If polyembryonic specimens are found, they should be preserved, preferably in a two per cent solution of formaline. The polyembryony shows itself in two ways: — first, in the production of two or more perfect embryos, one usually much larger than the others, from a single seed; and second, in single embryos composed of two or more variously united, thus showing

several cotyledons of diverse sizes and irregular positions. The earlier in the summer observations are made on the germinating seeds the better, since the smaller embryos are usually soon crowded out and killed by the growth of the larger. One may either observe the sprouting seeds growing naturally among the old plants, or gather ripe fruits and grow the seeds in pots the next spring. Similar observations upon *O. Rafinesquii* are desirable, especially as it is not known whether or not that species is polyembryonic at all. — W. F. Ganong, Smith College.

LIST OF VERMONT MYXOMYCETES WITH NOTES.

Luella C. Whitney.

The following list of forty-six species is a complete catalogue of the Myxomycetes thus far found in Vermont. This group of plants was studied at Middlebury College by Miss F. M. Sutton and the writer, who took their material from the collections made by Dr. E. A. Burt of Middlebury College and Prof. L. R. Jones of the University of Vermont. Speciments of all but two are now in the College Herbarium.

Badhamia utricularis Berk., *B. magna* Pk., *B. macrocarpa* Rost.; *Physarum leucopus* Link, *P. viride* Pers., *P. murinum* List., *P. nutans* Pers., *P. didermoides* Rost., *P. cinereum* Pers., *P. bivalve* Pers., *P. contextum* Pers., *P. virescens* Ditm.; *Fuligo septica* Gmelin, *F. ochracea* Pk.; *Leocarpus vernicosus* Link; *Chondrioderma spumarioides* Rost., *C. globosum* Rost.; *Didymium farinaceum* Schrad.; *Spumaria alba* DC.; *Stemonitis fusca* Roth, *S. splendens* Rost., *S. ferruginea* Ehrenb., *S. Smithii* Macbr.; *Comatrichia typhoides* Rost.; *Lamproderma physaroides* Rost.; *Brefeldia maxima* Rost.; *Cribraria macrocarpa* Schrad.; *Tubulina fragiformis* Pers.; *Siphoptychium Casparyi* Rost.; *Enteridium Rozeanum* Wing.; *Trichia favoginea* Pers., *T. persimilis* Karst., *T. scabra* Rost., *T. varia* Pers., *T. contorta* Rost., *T. fallax* Pers.; *Hemitrichia rubiformis* Pers., *H. clavata* Pers., *H. Serpula* Pers.; *Arcyria ferruginea* Sauter, *A. albida* Pers., *A. punicea* Pers., *A. incarnata* Pers., *A. flava* Pers.; *Perichaena populina* Fr.; *Lycogala miniatum* Pers.

Siphoptychium Casparyi Rost., which has hitherto been recorded for only two American stations, the Adirondacks and the White Mountains, was found growing profusely on a log near Lost Pleiad Pond. In this species the cylindrical sporangia are united to form an aethalium,

which is dark brown in color and which spreads to several inches in circumference. The presence of a central columella, connecting with the walls by lateral threads, is the constant feature which distinguishes this species from *Tubulina fragiformis.*

PHYSARUM LEUCOPUS Link, which has been recorded in this country for the western States only, was found in Middlebury, growing on a decayed log. The ball-like sporangia, which have membranous walls beset with lime, are supported on smooth white stalks also containing lime. The capillitium consists of large lime knots connected by slender hyaline threads. The snowy whiteness of the stalks is the means of separating this species from *P. nutans.*, while the lax capillitium and the large knots containing large lime granules distinguish this species from *P. globuliferum.*

BADHAMIA MAGNA Pk., a purely American species and of unusual occurrence, has been found twice in Vermont. The gray, globose sporangia with wrinkled iridescent walls are raised on clustered, yellow stalks. The capillitium is formed of threads or bands connected by angular expansions having small granular deposits of lime. *Badhamia hyalina* is sometimes confused with this species because of the similarity of capillitium structure, but by comparing the large warted and clustered spores of this species with the spores of *B. magna*, which are smaller and scattered, the difficulty is cleared.

PHYSARUM CINEREUM Pers. is not an unusual species, yet it is worthy of note because its capillitium shows Badhamia characteristics. The sporangia are sessile and irregular in shape, with lime granules in the membranous walls. The capillitium consists of branching bands and large white lime knots with a very few hyaline threads. These bands were so densely charged with lime that the species seemed to be *B. panicea*, but the presence of a few hyaline threads and the size of the small light-colored spores marked the species as *P. cinereum*. A specimen from the collection was submitted to Mr. Arthur Lister for his opinion, and he regards it as an undoubted but very remarkable form of *P. cinereum* Pers.

FULIGO OCHRACEA Pk. is another American species seldom found. The sporangia are very closely interwoven to form an aethalium with a gray cortex containing lime. The capillitium consists of very short hyaline threads connecting large yellow lime knots. The shortness of these threads together with the large spores are the only points of difference between this species and the closely allied *Fuligo septica.*

Lycogala miniatum Pers. and Hemitrichia clavata Rost. are our most widely distributed species. These species are found from July to December on tree stumps and decayed bark.

Stemonitis fusca Roth and Trichia fallax Pers. are other very common species found in late summer and autumn on twigs, leaves and logs.

Liquidambar at Greenwich, Connecticut. — Both in the Berzelius Catalogue of Plants within Thirty Miles of New Haven and in Bishop's Catalogue of Plants of Connecticut, *Liquidambar Styraciflua*, L., is recorded as growing at Greenwich, Connecticut, with the further note that this appears to be the northeastern limit of its natural growth. There is no specimen from the State in the herbarium of the late Professor Eaton, and up to November, 1898, I had never had any more definite information in regard to this station; but happening to pass through Greenwich in that month, I came upon it accidentally.

On May 1, 1899, I revisited the spot in company with a friend. We had no difficulty in finding the Liquidambar again, but were somewhat disappointed that the flowers were immature. I took, however, a quantity of budded branchlets, which were placed in water and developed into fair specimens.

The Liquidambar grows in a piece of marshy woodland about a half mile southwest from the railway station at Cos Cob, and is easily found by taking the first road crossing the track west of this station and following it south a little less than a half mile. It grows in considerable abundance over an area of at least five or six acres and reaches a size (by estimate) of two feet in diameter and seventy feet in height. The march of "improvement," in the shape of summer residences and their grounds, is close upon it, but it is to be hoped that the swampy nature of the ground may preserve to New England a station for the natural growth of this beautiful tree.

Owing to the earliness of the season and limited time for botanizing, little else of interest was observed on this trip. At Mianus the cliff by the Mianus River was white with *Arabis lyrata*, L., which appear to be scarce in Connecticut except on the trap ridges of the Connecticut valley; and nearer Stamford was a tree of *Pinus*

rigida Mill., with leaves reaching seven inches in length, decidedly longer than in the common form about here. — E. B. HARGER, Oxford, Ct.

AT the approaching meeting of the American Association for the Advancement of Science, which occurs at Columbus, the home of the distinguished bryologists, W. S. Sullivant and Leo Lesquereux, the subject of the mosses will receive a fitting prominence in the exercises of the botanical section. Historical papers on the development of American bryology will be read and a collection of important specimens, photographs, rare papers, microscopic preparations, portraits, manuscripts, etc., of special interest to moss-students will be brought together for exhibition. The following well-chosen committee have charge of this feature of the Columbus meeting: Professor C. R. Barnes, Univ. of Chicago; Mrs. N. L. Britton, N. Y. Botanical Gardens; Professor W. A. Kellerman, Ohio State Univ.; Dr. G. G. Kennedy, Readville, Mass.; Professor L. M. Underwood, Columbia Univ.

TWO AMBIGUOUS LOOSESTRIFES FROM THE NORTHERN STATES.

M. L. FERNALD.

(Plate 6.)

A VERY handsome loosestrife, with racemes often a foot and a half long, has been collected in several parts of New England during the past few years. By some it has been considered a form of *Lysimachia stricta*, by some a form of *L. quadrifolia*, while others have regarded it as intermediate between those two common species. Attention was recently called to the plant in New England by Dr. Geo. G. Kennedy, who collected it in 1889 at Sorrento, Maine, and in the following year at Milton, Massachusetts. In July, 1897, Messrs. Edwin Faxon, Edward L. Rand and Emile F. Williams found it in some abundance on Mt. Desert Island; in the autumn of that year Miss Kate Furbish brought from Gilead, Maine, fruiting specimens of the same thing; and in the summer of 1898 the writer was shown by Miss Rebecca Gill a drawing of the plant made by her at Peterboro, New Hampshire.

The plant has been known to botanists, however, for many years. It is without doubt the form described by Dr. Gray in the second edition of the Manual as *Lysimachia stricta*, var. *producta*. Dr. Gray's only specimen was collected in Michigan, but he refers to his variety a portion of Michaux's *L. racemosa*[1] from New York. From Michaux's description alone there is little to suggest Dr. Gray's var. *producta*. Michaux describes his plant as having opposite leaves, and he cited a figure of Plukenet's[2] which is obviously the common *L. stricta*, with its definitely terminal raceme shorter than in the var. *producta*. In examining the Michaux herbarium, however, Dr. Gray noted that his specimen of *Lysimachia racemosa* is a "strange and monstrous form of *L. stricta*, with a raceme eighteen inches long, ped[icel] one inch, twice the length of the foliaceous bract, the whole terminated by a little tuft of bracteal leaves. Pedicels also in the axils of the upper leaves." This plant is probably identical with Dr. Gray's var. *producta*, and the specimens which have recently puzzled New England botanists. Lamarck had formerly described as *L. racemosa*[3] a plant with lanceolate opposite leaves which is clearly the older *L. stricta*, Ait.,[4] and, in his description, Lamarck cited the same Plukenet figure which was referred to by Michaux as representing his own *L. racemosa*. It appears, then, that the species of Michaux was a confusion of two plants: one the true *L. stricta*, Ait., the other the var. *producta*, Gray.

The plant has apparently been mentioned occasionally in local lists and notes (Peck's 47th Rep. 31, for example) as a variety of *L. stricta*. The latter species, however, in its typical form has the terminal raceme rarely 2.5 dm. long, beginning definitely above the upper stem-leaves, which are lanceolate, glaucous and hardly veiny beneath, and opposite. In the variety *producta*, on the other hand, the leaves, not otherwise unlike those of *L. stricta*, are often subverticillate or definitely verticillate in 3's, 4's, or 5's, as in *L. quadrifolia*. The pedicels are borne in the axils of the upper leaves as in *L. quadrifolia*, but unlike that species the raceme is very elongated, the upper leaves passing gradually to the floral-leaves or leafy bracts. Though in its inflorescence and especially in the axillary lower pedicels the plant is somewhat like *L. quadrifolia*, it is in other respects quite as distinct from that as from *L. stricta*, with its definite terminal raceme. In its very elongated bracteate raceme the plant is of course strikingly

1 Michx. Fl. i. 128.
2 Pluk. Phytog. t. 428, f. 4.
3 Lam. Dict. iii. 570.
4 Aiton, Hort. Kew. ed. 1, i. 199.

unlike *L. quadrifolia*; and the leaves, which in *L. quadrifolia* are broader, generally less attenuate and not pale beneath, in the variety *producta* are nearly as pale as in *L. stricta*.

Another plant with the same affinities as *Lysimachia stricta*, var. *producta*, but habitally very unlike it, was found in late July, 1898, by Mr. J. C. Parlin and the writer, in a damp thicket back of Wells Beach, Maine. This plant, which there occurred in great abundance, combines to some extent the characters of *L. stricta* and *L. quadrifolia*. Unlike *L. stricta*, var. *producta*, however, it has the broad, hardly glaucous and strongly veiny whorled leaves of *L. quadrifolia*, but the lower pedicels of the very long raceme are borne in the upper axils as in both those plants. The leaves change, though, very abruptly to short foliaceous bracts subtending the rather crowded pedicels. In the preparation of their Flora of North America, Torrey and Gray considered a similar plant — from White Plains, New York, and from Washington, D. C. — as a variety of *Lysimachia quadrifolia*, and it was noted as such (without a name) by Dr. Gray in the second edition of the Manual.

It has been suggested that these two plants, combining as they do certain characters of *Lysimachia stricta* and the earlier flowering *L. quadrifolia*, may be hybrids between them. Such an origin for the plants is not impossible; but, as *L. stricta* generally begins to flower after *L. quadrifolia* has practically passed its flowering season, and as the one occurs usually in dry woods or open, dry soil, and the other in very wet places (though both are rarely found together), it does not seem probable that they would freely hybridize, nor, should hybrids occur, that they would be found so abundantly over large areas. Furthermore, the so-called variety *producta* was collected by the late Herbert A. Young on Oak Island, as a variety of *L. quadrifolia*, but the true *L. stricta* was not included by him in his very exhaustive Flora of Oak Island. And at Wells Beach, where the other plant with a long raceme was found, *L. quadrifolia* of the dry soil was quite past flowering in late July, when the more showy plant was at the height of its blooming. The opposite-leaved *L. stricta*, however, with its definite shorter raceme, was then flowering near by. It is quite possible that these plants, in some of their characters suggesting hybrids between *Lysimachia stricta* and *L. quadrifolia*, may have had such origins. Their great abundance, however, in the regions where they occur, and their very broad distribution, together with their constant and char-

acteristic habits, tend to show that these plants have now attained a degree of permanence, making the treatment of them as species more satisfactory.

The name, *Lysimachia racemosa*, which probably referred in part to the plant just discussed in these notes, was, as already explained, unfortunately used by Michaux for *L. stricta* as well. And, furthermore, to take up that name, formerly applied by Lamarck to *L. stricta*, would lead to confusion. The varietal name used by Dr. Gray to designate this plant is the first which is quite free from confusion and possible doubt, and it is here applied to the plant now proposed as a species. The other plant, from Wells Beach, etc., although described, appears never to have received a name.

Lysimachia producta. Stem glabrous, 0.5 to 1 m. high, simple or slightly branched: leaves opposite or in whorls of from 3 to 5, lanceolate, pale green or glaucous and scarcely veiny beneath, longer than the lower axillary pedicels (2 or 3 cm. long): raceme terminal, 5 dm. or less in length, the ascending pedicels subtended by leafy bracts gradually diminishing in size towards the tip of the loosely flowered raceme: calyx 5 to 7 mm. high, the 5 divisions lance-attenuate: corolla 1.5 to 2 cm. broad, crimson at the base; the divisions ovate-oblong, rounded at the tips, with many dark lines: filaments unequal, dilated below, and united into a cup 1.5 to 2 mm. high, the sinuses broad and rounded. — *L. racemosa*, Michx. Fl. i. 128, in part, not Lam. *L. stricta*, Ait., var. *producta*, Gray, Man. ed. 2, 272. — In damp thickets and low ground, Maine and Massachusetts to Michigan. Maine, Sorrento, Aug. 10, 1889 (*Geo. G. Kennedy*); Mt. Desert Island, — head of North East Harbor and Lower Hadlock Pond, July 12, 1897 (*E. Faxon, E. L. Rand, E. F. Williams*), Upper Hadlock Pond, July 9, 1898, Wildwood Farm road, July 11, 1898, Long Pond Meadows, July 22, 1898 (*E. L. Rand*); by the Androscoggin, Gilead, September, 1897 (*Miss Kate Furbish*): New Hampshire, Peterboro, July, 1898 (*Miss Rebecca Gill*): Massachusetts, Grantville (Wellesley), July 12, 1854 (*Wm. Boott*); Oak Island, Revere, July 16, 1882 (*Herbert A. Young*); Milton, June 22, 1890 (*Geo. G. Kennedy*): New York, reported by *Prof. C. H. Peck* (47th Rep. 31) from Narrowsburg, and originally collected in "New Yorck" by the elder *Michaux*: Michigan, without statement of locality and collector (Gray Herb.).

L. polyantha. Stem glabrous, 6 to 9 dm. high, simple or branched above: leaves generally in whorls of from 3 to 5, rarely opposite, ovate-lanceolate, rather veiny beneath, not glaucous, longer than the axillary pedicels (2 cm. in length), changing abruptly above to foliaceous bracts: racemes terminal, the primary one from 5 cm. to 5 dm. long, profusely flowered (often densely so at the tips), the slender

spreading or slightly ascending pedicels subtended by lanceolate bracts about half their length: calyx about 4 cm. high, the divisions lance-attenuate: corolla as in *L. producta*, but the oblong-lanceolate divisions narrower: the sinuses between the filaments narrow and acute.—*L. quadrifolia*, L., var., Gray, l. c. 273.—In damp thickets, Maine to the District of Columbia. MAINE, Wells Beach, July 23, 1898 (*J. C. Parlin & M. L. Fernald*): NEW YORK, White Plains (*H. J. Clark*): DISTRICT OF COLUMBIA, Washington (*Dr. Crandall*).

EXPLANATION OF PLATE 6.—*Lysimachia producta*: fig. 1, upper portion of plant, reduced; fig. 2, corolla; fig. 3, androecium. *L. polyantha*: fig. 4, upper portion of plant, reduced; fig. 5, corolla; fig. 6, androecium.

PINUS BANKSIANA ON MT. DESERT ISLAND.—Since the discovery of the northern scrub pine (*Pinus Banksiana*, Lamb.) on Schoodic Mountain and about Prospect Harbor, in the coast town of Gouldsboro, Maine,[1] I have expected to find it on Mount Desert Island as well, although the wide expanse of Frenchman's Bay intervenes. After much unsuccessful search in all parts of the Island, I was fortunate enough in July, 1898, to discover it on an eastern slope of Green Mountain. There were about thirty small trees from six to twelve feet in height—all cone-bearing—scattered over a small area on a sheltered part of the mountain side. Owing to the protected situation, the trees were symmetrical, not dwarfed and contorted like those on Schoodic Mountain, or flattened and weather-beaten like those of the pitch pine (*Pinus rigida*, Mill.) on the exposed ridges elsewhere on Green Mountain. I noticed a few young trees of *P. Banksiana*, so that, if spared by fire, this interesting pine ought to increase at this station.

It should be here mentioned that it was reported some years ago to the late Edwin Faxon and myself, that on a certain farm near Long Heath, east of Somesville, a rather tall tree, "somewhere between a spruce and a pine," and the only one of its kind, had grown for many years. After one or two unsuccessful attempts we found the spot where the tree had been until broken down by an ice storm the winter before. No trace of it was then left from which its identity could be determined, but there is good reason to suppose that it was *Pinus Banksiana*. After the discovery of the Green Mountain station I took specimens of the pine to Somesville and showed them to persons who knew and had

1 Bull. Torr. Bot. Club, **16**: 294, 295.

noticed the peculiarities of the unidentified tree. Without hesitation they asserted that the cones and foliage of this tree were the same. It is not unreasonable, therefore, to expect that larger trees of *Pinus Banksiana* may be found at a lower altitude on Mount Desert, as they are on the Schoodic Peninsula. — E. L. Rand, Boston, Mass.

Kalmia latifolia in Vermont. — Through the kindness of Prof. L. R. Jones, of the University of Vermont, I have been enabled to see specimens of the Mountain Laurel from two localities in his State: Pownal, where Mr. W. W. Eggleston collected the plant on West Mountain, July 24, 1898; and Newfane, where the species was taken on the banks of West River, June, 1894. Prof. Jones tells me that he has seen the plant near Brattleboro. Dr. A. J. Grout also reports it as abundant at Newfane and Dummerston.

The space devoted to this plant in my list in Rhodora, Vol. I, No. 5, can now be filled with a cross. — Walter Deane.

A peculiar state of Polyporus pergamenus. — An unusual form of the very variable *Polyporus* (*Polystictus*) *pergamenus* Fr. was found in Middlesex Fells in November, by Mrs. H. C. DeLong. It shows in a remarkable way the tendency of the species, long ago noted by Peck, to revive the second year by putting on a new growth at the edge of the pileus. In this case, to judge from the specimens, the branch or trunk on which the plants had grown the first year having been turned upside down, the new growth took place with the pilei of the first year inverted. Under these conditions the plant had a rare chance to display that ready adaptability to circumstances common to this and other species. Along the outer edges, now turned up, of the old pilei, new pilei developed in a normal position, a number of new ones on each of the old. As these grew nearly to normal size their bases developed a confluent portion, effused over the under (originally upper) surface of the old pilei. Though the revivification took place mainly along the edges, numerous tiny pilei were formed on projecting portions of the old hymenium. In these, which began to grow vertically upward, the dorsal (normally upper) surface faced uniformly the distal (outer) edges of the old pilei, their lateral expansion thus corresponding with the transverse serial lines of pores that are characteristic of the species. On the other hand, the unvarying tendency of the much larger sec-

ondary pilei originating on the very margin and under (originally upper) surface of the old pilei was to face exactly the other way. — Hollis Webster.

Synopsis of the 15th Contribution from the Gray Herbarium. — In a recently published number (new series, No. XV.) of the Contributions from the Gray Herbarium of Harvard University (Proc. Am. Acad. XXXIV. No. 19, pp. 483–504, with plate), two common groups of sedges are discussed by Mr. M. L. Fernald: "*Eleocharis ovata* and its American Allies," and "*Scirpus Eriophorum* and some Related Forms." These two species have been so long the repositories for such specimens as would conveniently go nowhere else that they have become, as commonly accepted in America, very confused. In attempting to clear *Eleocharis ovata* from the confusion which has surrounded it, it has been necessary to define six American species, two of them new, and six varieties. Seven of these plants are known in New England, though some are very local. Their most important distinguishing characters and their ranges may be briefly stated in the following analytical key, which is practically that of Mr. Fernald's paper:

Bristles overtopping the body of the achene.
- Tubercle nearly or quite as broad as the achene: heads from globose-ovate to ovate-oblong: scales brown, obtuse.
  - Culms stout, ascending, 1 to 5 dm. high: heads densely flowered, 3 to 13 mm. long (from central Maine southward and westward). *E. obtusa*, Schultes.
  - Culms capillary, generally spreading, 1 (rarely 2) dm. or less high: heads fewer-flowered, 2 to 5 mm. long (range of former). *E. obtusa*, var. *jejuna*, Fernald.
- Tubercle distinctly narrower than the achene.
  - Culms erect or ascending (northern Maine and northern Vermont, local). *E. ovata*, R. Br.
  - Culms flexuous, generally recurved or prostrate (northern and central Maine; eastern Massachusetts). *E. ovata*, var. *Heuseri*, Uechtritz.

Bristles about equalling or shorter than the body of the achene or obsolete or none.
- Tubercle nearly or quite as broad as the achene: heads narrow, oblong or subcylindric with close-appressed scales.
  - Retrorsely barbed bristles about equalling the achene (Massachusetts and Connecticut, rare). *E. Engelmanni* Steud.
  - Bristles short and naked or absent (eastern Massachusetts). *E. Engelmanni*, var. *detonsa*, Gray.
- Tubercle distinctly narrower than the achene: heads ovoid, with scarcely appressed scales: bristles obsolete or none (Connecticut, local). *E. diandra*, Wright.

Under the name *Scirpus Eriophorum* (*Eriophorum cyperinum*) two very distinct specific types have been confused, a slender northern

species, maturing its greenish-brown or drab umbels in early summer, and a stouter plant of broader southern range maturing its ferruginous umbels in late summer or fall. The New England forms of these plants may be summarized as follows:

Culms stout (just below the involucre averaging 3 mm. in diameter): leaves 4.5 to 11 (average 6) mm. wide: involucre usually ferruginous at base: scales and bristles ferruginous.

Spikelets ovate to ovoid-oblong, 3.5 to 6 (average 4.5) mm. long.

Rays of umbel elongated, ascending or spreading: spikelets in glomerules of 3 or more (eastern Maine, southward and westward).
S. Eriophorum, var. *cyperinus*, Gray.

Rays of umbel short (6 cm. or less in length): glomerules in dense masses (eastern Maine and eastern Massachusetts).
S. Eriophorum, var. *condensatus*, Fernald.

Spikelets oblong, 7 to 10 mm. long:

Rays of umbel elongated and pendulous: glomerules with many spikelets (central Connecticut). . . . . *S. Eriophorum*, var. *Andrewsii*, Fernald.

Culms slender (averaging 1.5 mm. in diameter): leaves 2 to 5 (average 3.5) mm. wide: involucre black at base: scales greenish black: bristles drab or olive-brown, not ferruginous.

Rays of umbel slender and elongated, with drooping tips (from central Connecticut northward). . . . . *S. atrocinctus*, Fernald.

Rays of umbel short; inflorescence capitate or subcapitate (northeastern Massachusetts northward, mostly in the mountains).
S. atrocinctus, var. *brachypodus*, Fernald.

THE LOCAL FLORAS OF NEW ENGLAND.

Mary A. Day.

(Continued from p. 120.)

New Hampshire.

Coös, Carroll, and Grafton Counties (White Mountain Region): —

91. **Jesup, Henry Griswold.** Catalogue of the more common plants to be found within twelve miles of Hanover, N. H., during April, May and June, both native and introduced. Hanover, N. H. 1879, pp. 14. Annot. catalog. *phaenog.* and *cryptog.*

92. —— A preliminary catalogue of the flowering plants and higher cryptogams growing without cultivation within thirty miles of Hanover, N. H., to which is appended a list of the vertebrates of the same region. Hanover, N. H. 1882, pp. 74. Annot. catalog. *phaenog.* and *cryptog.*

93. —— A catalogue of the flowering plants and higher cryptogams, both native and introduced, found within about thirty miles of Hanover, N. H., including a few cultivated species, to which is appended a list of vertebrate animals of the same region. Hanover, N. H. 1891, pp. 91. Map. Annot. catalog. *phaenog.* and *cryptog.*

94. **Oakes, William.** NOTICE OF SOME OF THE MOSSES OF NEW ENGLAND. Hovey's Mag. xiii. 1847, pp. 171–174. Annot. catalog. *cryptog.*

95. **Prime, William Cowper.** THE FLORA OF FRANCONIA IN SPRINGTIME. Lonesome Lake papers, N. Y. Jour. Commerce, June, 1882. Not seen.

96. **Pychowska, Lucia Duncan.** BOTANICAL NOTES MADE IN THE SUMMER OF 1882 AT RANDOLPH, N. H. Appalachia, iii. 1882–84, pp. 168–169. Select. spec., popular treatm. *phaenog.* N. H.

97. **Rafinesque-Schmaltz, Constantine Samuel.** FLORULA OF THE WHITE MOUNTAINS OF NEW HAMPSHIRE. Am. Month. Mag. i. 1817, pp. 440–441. List. *phaenog.* and *vasc. cryptog.*

Extracted from a paper published in N. E. Jour. Med. and Surg. for Oct., 1816, by Jacob Bigelow, under the title of Some account of the White Mts. of New Hampshire.

98. **Russell, John Lewis.** SOME CRYPTOGAMOUS PLANTS GATHERED IN THE VICINITY OF KEARSARGE MOUNTAIN, NEW HAMPSHIRE. Hovey's Mag. ix. 1843, pp. 140–141. Select. spec., popular treatm. *cryptog.*

Hillsborough County: —

99. **Batchelder, Frederick William.** BIRDS AND FLOWERS OF NEW ENGLAND. Manchester Union, April 15, 1896 to December 16, 1897. 52 articles. Select. spec., popular treatm. *phaenog.* Mr. Batchelder's library.

Lists — no. 8, orchids; no. 15, Quercus; no. 26, Coniferae; no. 42, ferns; no. 51, trees.

100. **Blood, Henry Ames.** TEMPLE FLORA. In his History of Temple, N. H. 1860, pp. 185–187. Annot. catalog. *phaenog.* and *vasc. cryptog.* H. C.

"The material for this chapter was mostly furnished me by two highly educated ladies; one a former school-teacher in Temple, now a resident in New Ipswich, the other a native of Temple, now a teacher in Mt. Holyoke Seminary."

101. **Osgood, Lydia Dinsmore.** FLORA OF HANCOCK. In Hayward, W. W. History of Hancock, N. H., 1764–1889. 1889, pp. 60–66. List. *phaenog.* and *vasc. cryptog.*

Rockingham County: —

102. **Harris, William Samuel.** THE FLORA OF THE TOWN OF WINDHAM, ROCKINGHAM COUNTY, NEW HAMPSHIRE. In Morrison, L. A. Supplementary history of the town of Windham, N. H. 1892. Reprint, privately printed, 1892, pp. 31. Annot. catalog. *phaenog.* and *vasc. cryptog.*

Stratford County: —

103. **Chesley, Charles Henry.** A list of plants found in Barrington and adjoining towns. Manchester Union, January 15, 22, 29, February 5, 12, 19, 26, 1898. Annot. catalog. *phaenog.* and *vasc. cryptog.*

VERMONT.

General works: —

104. **Frost, Charles Christopher.** Catalogue of cryptogamous or flowerless plants of Vermont. Archiv. of Sci. and Trans. Orleans Co. Soc. Nat. Hist. i. 1871, pp. 78–81, 111–117, 152–153, 192–195, 234–240, 249–252. Annot. catalog. *cryptog.* Not seen.

105. **Grout, Abel Joel.** A list of the mosses of Vermont with analytical keys to the genera and species. Published by the Botanical Department of the Univ. of Vermont. 1898, pp. 37. Annot. catalog. *cryptog.*

106. **Oakes, William.** Catalogue of Vermont plants. In Thompson, Z. Nat. Hist. Vermont, 1842, pp. 173–208. Reprint. Annot. catalog. *phaenog.* and *vasc. cryptog.* Continuation of the same in Appendix, 1853, pp. 36–40, arranged by John Torrey.

107. **Orton, William Allen.** A partial list of the parasitic Fungi of Vermont. 11th Ann. Rep. Vermont Exper. Sta. ii. 1897–98, pp. 202–219. Reprint, pp. 21. Annot. catalog. *cryptog.*

108. **Perkins, George Henry.** Catalogue of the flowering plants of Vermont. Archiv of Sci. and Trans. Orleans Co. Soc. Nat. Hist. i. 1872–73, pp. 161–166, 181–190, 215–218, 231–234, 252–253. Annot. catalog. *phaenog.*

109. —— Catalogue of the flora of Vermont, including phaenogamous and vascular cryptogamous plants growing without cultivation. Burlington, 1888, pp. 74. From the 10th Ann. Rep. of the State Board Agric. Annot. catalog. *phaenog.* and *vasc. cryptog.*

110. —— A general catalogue of the flora of Vermont. Montpelier, 1882, pp. 49. Annot. catalog. *phaenog.* and *vasc. cryptog.*

111. **Pringle, Cyrus Guernsey.** Notes on alpine and subalpine plants in Vermont. Am. Nat. x. 1876, pp. 741–743. Select. spec., popular treatm. *phaenog.* and *vasc. cryptog.*

112. —— The weeds of Vermont. 1st Ann. Rep. State Board Agric. Vermont, 1872, pp. 266–292. Annot. catalog. *phaenog.* B. P.

113. **R[ussell, John Lewis].** Some of the rarer plants of Vermont. Hovey's Mag. xviii. 1852, pp. 481–485. Select. spec., popular treatm. *phaenog.* and *cryptog.*

114. **Williams, Samuel.** FOREST TREES, ESCULENT AND MEDICINAL VEGETABLES. In his Natural and civil history of Vermont, 1794, pp. 67–71. Annot. catalog. *phaenog.* B. A.
Same in ed. 2, 1809, pp. 81–87. B. A.

Addison County: —

115. **James, Edwin.** CATALOGUE OF PLANTS [OF MIDDLEBURY, VT.]. In Hall, F. Statistical account of the town of Middlebury, in the State of Vermont. Part first, 1821. Afterwards printed in Thompson, Z. Statistical Gazetteer of Vermont, 1824. Reissued in Coll. Mass. Hist. Soc. ser. 2, ix. 1832, pp. 146–148. List. *phaenog.* and *vasc. cryptog.* B. P.

Chittenden County: —

116. **Eggleston, Willard Webster.** FLORA OF MT. MANSFIELD. Bot. Gaz. xx, 1895, pp. 72–75. Select. spec., popular treatm. *phaenog.* and *vasc. cryptog.*

117. **Preston, Howard Willis.** A BOTANICAL EXCURSION TO MT. MANSFIELD AND SMUGGLER'S NOTCH. Am. Nat. xvi. 1882, pp. 901–905. Select. spec., popular treatm. *phaenog.* and *vasc. cryptog.*

Orleans County: —

118. **Ridler, Charles Eaton.** FLORA OF WILLOUGHBY NOTCH (JULY 14, 1884). Appalachia, iv. 1884, pp. 64–68. Select. spec., popular treatm. *phaenog.* M. H.

119. **Rusby, Henry Hurd.** THE WILLOUGHBY LAKE AND MOUNTAIN FLORA. Bull. Pharmacy, January, 1893. Reprint. Annot. catalog. *phaenog.* and *vasc. cryptog.* F. G. Floyd's library.

Windham County: —

120. **Brown, Ann E.** WILLOWS [OF BRATTLEBORO, VT.]. Bull. Torr. Club, iii. 1872, pp. 26–27. Annot. catalog. *phaenog.*

MASSACHUSETTS.

General works: —

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(To be continued.)

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C. E. Faxon del.

Fig. 1–3, Lysimachia producta. Fig. 4–6, Lysimachia polyantha.

Rhodora

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PAST AND PRESENT FLORAL CONDITIONS IN CENTRAL MASSACHUSETTS.

G. E. Stone.

In an area like Massachusetts, which is thickly populated, and which has been settled for over two hundred years, an area in which the agricultural industries have changed to that of manufacturing, and in which the forest growths have been removed a number of times, we have an opportunity to study the methods of deforestation which have prevailed in New England from its earliest settlement, and the effects of these methods upon the floral conditions.

The tree growths of central Massachusetts differ from those of other parts of the state only in so far as climate and soil peculiarities are concerned. The characteristic forest trees in this locality are the pine, chestnut, oak, and birch. The pine and chestnut are especially adapted to this region, as is shown by their great abundance, both of these being more common in central Massachusetts than in any other portion of the state. The pine is especially abundant here, because of the fact that it can adapt itself to a great variety of conditions.

The historical records of our forests date back as far as 1634, in fact, to the time of the early settlements in New England. They show, on the whole, that the climatic conditions have probably not changed very much, though undoubtedly local effects have been brought about by the removal of the forests, and also from industrial activities.

Excepting two mountains about two thousand feet high, the central portion of Massachusetts has an average elevation of one thousand feet, which gradually descends on the eastern and western border to one of about three hundred or four hundred feet. Of the species which thrive better on the higher elevation may be mentioned the red spruce, mountain maple, striped maple, mountain ash, beech, canoe birch and

mountain laurel. The latter reaches its height of perfection here, while on the other hand, this elevation not infrequently gives rise to stunted growths in certain species. Geologically this region is composed largely of gneiss, with limited areas of mica schist, over which is spread sand and clay, deposited in various combinations. The sand is more common in the eastern than in the western portion, a fact which holds good throughout the whole state, as does also the per cent of chlorine which the soil contains, and this, just as might be expected, exerts a modifying influence on the flora. Passing northerly and southerly along the central ridge are numerous lenticular clay hills, known as drumlins, which once supported a marked characteristic growth. The hills, for many reasons, were among the first lands to be utilized, and they constitute the best agricultural soil to-day. They were early cleared of their forests, so that it is at present difficult to find any of them completely covered with tree growth. The English settlers, in choosing these hills, simply followed to a certain extent in the footsteps of the Indians, inasmuch as they had cleared quite a number before the advent of the white man. The characteristic growth upon these hills is and always has been, of hard wood of such species as the chestnut and oak. When, however, there is a superficial deposit of sand, as is sometimes the case, they give rise to pine and other species. No less characteristic are the species found on the gravelly ridges known as kames or eskars. They support to-day, as of old, a growth of pitch pine, scrub oak, chinquapin oak and white birch. These trees are peculiar also to the sandy plains, while the cold, damp, rocky hillsides are adapted to the hemlock, canoe birch and beech, though other trees monopolize this soil to-day. The borders of the meadow give rise to the alder, witch hazel, ironwood and red maple. The variety of loamy soil furnishes an environment for the pine, chestnut and oak, and the swamps contain the black spruce, hackmatack, white cedar, and occasionally, the arbor vitae.

The principal forest trees at present are the pine, chestnut, oak, birch, maple, alder, poplar, willow, ironwood, hickory, hemlock, ash, cedar, spruce, beech. Their predominance follows quite closely after the order named. This order is not, however, the same as that which occurred in the primitive forests. The hemlock, beech and canoe birch have decreased and other species have taken their places. The pine was always, and is to-day, a valuable and prominent tree in this region, and undoubtedly is holding its own. The amount of young pines now

in central Massachusetts is considerable. There is, in fact, no tree which takes so readily to the old and neglected pastures, as does the pine, and they are gradually becoming filled with this species. This is a most fortunate occurrence, as these old pastures are practically worthless for other purposes, and it is by this means that the pine holds its own so readily, and compensates for that loss which occurs in consequence of rotation with hard wood where forests of this tree have been cleared. The chestnut propagates itself almost entirely by sprouts, hence the old term, "sprout lot." There is consequently no rotation which takes place in this species. The same old soil which produced chestnut for centuries is producing it to-day, and apparently with the same vigor. It is interesting to note that each successive growth of chestnut always springs from the same old stump and root system; from which it would appear that the same old root system, or at least offshoots of it, has been supporting chestnuts since the glacial period. In the clearing of so many of the clay hills in olden times the habitat of the chestnut was somewhat reduced, and notwithstanding the enormous quantity of seed produced every year by this tree, many of which escape the squirrel and small boy, comparatively few trees of this species originated from seed. The chestnut, therefore, is not so abundant as formerly, though it maintains a uniform distribution.

The oak occurs with the chestnut and undoubtedly is as abundant as ever. This tree is placed third in the list, but in the old primitive forests, I am inclined to believe that the hemlock would fill this place. At the present time, however, it is a considerably rarer tree. No tree in central Massachusetts has fallen behind like the hemlock. When forests of this tree are cut one seldom finds a second growth of any pretension, and a third growth is even more rare. I believe it is within the bounds of accuracy to state that the hemlock has fallen off over eighty-five per cent. This is not from the lack of seed production, but from the fact that the seedlings do not find the proper conditions for thriving. It is a well-known fact that the hemlock seedling requires shade, and when forests of these trees are cut, they do not furnish the proper conditions for this development. As the hemlock, however, has decreased, the white birch and poplar have increased, but they, at present, possess little commercial value. In the old forests the conditions were such that they were more scattered, being confined to openings and to the borders of woods, but now they form large groups in themselves.

The alder, ironwood, red maple and hazel, border the meadows and

streams as of old, and are perhaps slightly more abundant than formerly, as now they have a greater latitude of growth. The hickory, ash, white maple, rock maple and hop-hornbean have not changed materially; the latter, however, is not abundant, and very likely never has been. The elm, which is quite abundant, and the sycamore, which is less so, retain their old habitats along the river valleys, and the white cedar, hackmatack and black spruce have shared with one another the absolute monopoly of the swamps for centuries. Excepting for the flooding of so many of the swamps for artificial ponds, these species remain precisely the same. The beech and canoe birch have both fallen off; the beech more especially, as this tree does not seed very abundantly here, and, by the present methods of deforestation, the soil conditions are rendered unfit for the development of this species.

Briefly stated, then, we may say that the principal changes which have taken place in the forests of central Massachusetts are these: The hemlock, beech and canoe birch have become less abundant, while the quicker growing white birch and poplar have become more abundant. The complete and continual removal of the forest growths has undoubtedly exerted a great influence upon many of our smaller plants.

One of the principal causes of the decline of our smaller plants can be traced directly to the lack of organic matter, or humus, in the soil. The methods of deforestation which have been employed for so many years are the cause of this. These methods consist in clearing vast areas of land of the trees — usually burning them over and subjecting them for a year or so to the scorching rays of the sun. By this process, the conditions of the soil undergo remarkable changes, and entirely different environmental conditions result. Very frequently the regions of cleared forest are utilized for pasture; then, after some years, they are again allowed to grow up to forests. But whatever use is made of the deforestated areas, the results are practically the same; namely, the organic matter, or humus, and the water conditions are entirely changed, which results in unfitting the soil for many plants.

The former luxuriance of our meadow grasses, and strawberries, and such humus loving plants as our orchids, can at the present time be imagined by catching glimpses of them growing under virgin soil conditions. The humus loving plants growing about Mt. Toby, Mt. Holyoke, and on the Berkshire Mountains where the forests are more like the primitive conditions, are generally twice or three times

the size of those found in the too frequently deforestated and thickly populated region of the eastern part of the state. There is no plant, however, which shows such a decline in Massachusetts as the strawberry,[1] and this is within the memory of men now living. Among other plants which possess much less limited habitats are *Habenaria Hookeri* and *H. orbiculata*, which thrive best in old pine woods; and *Orchis spectabilis*, *Cypripedium parviflorum* and *C. pubescens* do not find the requisite conditions for their growth and luxuriant development after successive deforestation, while species like *Habenaria ciliaris*, which possess an extremely limited habitat, have to my own knowledge become already exterminated in certain localities, owing to deforestation. So would the beech drops become less abundant with the decline of the beech, as this only grows parasitically upon its roots. And then there are hosts of plants, such as the Aralias, numerous species of Fungi, Mosses and Liverworts, which once thrived more abundantly and luxuriantly than at the present day. On the other hand, there are many plants such as the blackberry, raspberry, and checkerberry which grow more abundantly and luxuriantly after the first removal of the virgin forest, although these have undoubtedly declined, on account of the diminished organic matter in the soil.

In closing, however, it may be mentioned that the mere increase of certain species and decline of others, does not convey to us an adequate conception as to the difference in the external configuration which has taken place in our forest growths. In the decline of the hemlock, one of the most potent factors in the production of picturesque scenery has disappeared. Old forest growths of these somber trees resembled the "misty darkness of a cavern" and added much to the beauty of our pellucid streams. The original size of the forest trees was also an important factor in the make-up of the primitive forests. The pine at the present day is seldom seen with a diameter of over eighteen inches, whereas, in the old forests, specimens could be found six feet in diameter and two hundred and fifty feet high. The canoe birch trees could be found growing three feet in diameter, but to-day they rarely escape the axe after they have attained the thickness of eight or ten inches. The majority of pitch pines at present have a height of about twenty-five feet and a diameter of about fourteen inches, but I have seen individual specimens of mature old growth — 150 years old — which were eighty feet high and two feet in diameter.

[1] See Garden and Forest, ix. 82 (1896).

Growths of chestnut 150 years old, have a diameter of about twenty inches when growing singly, while in open places they frequently attain a diameter of three feet in sixty years, and sometimes grow very much larger than this. Chestnut, however, is usually cut for railroad ties when fifty or sixty years old, and about fourteen inches through, although this tree and the oak more often escape the woodman than does the pine.

In considering the changes which have taken place, the question naturally arises, whether if the forests were left undisturbed they would return to their former condition. Undoubtedly this would eventually take place, but it would require more than three hundred years for the hemlock to regain its former habitat. The decline of certain species and the increase of others is largely due to the ruthless methods of deforestation which have been in vogue here from the very beginning. Were a scientific or rational system of forestry maintained, the forest growth would not undergo such abrupt changes, but would tend to conform more to its primitive condition, and the entire floral condition would resemble quite closely that of old. From an economic point of view, the decline of the hemlock, and the increase of the birch and poplar is probably of not much importance. The most valuable trees, the pine and chestnut, are still common, and undoubtedly will remain so. However, there are still many hundred acres of old pasture that might be more profitably occupied by pine forests.

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A NEW GRIMMIA FROM MT. WASHINGTON.

E. G. Britton.

(Plate 7.)

Grimmia Evansi, spec. nov. Plants forming low, dense, dirty tufts of a dark green or yellowish brown color, only the uppermost ends of the branches being green and free from gravel. Stems about 15mm. high with short fastigiate branches 5mm. long, naked and radiculose below, crowded above with spreading leaves which are about 1mm. long by 0.5–0.7 mm. broad, oblong, concave, acute or apiculate with inrolled margins above forming a more or less cucullate apex, the stout vein ending in or just below the point which occasionally is formed by a single short hyaline cell; apical cells rounded and indistinct, slightly sinuous, composed more or less of two irregular layers of

cells, or frequently with only one layer and occasional groups of bistromatic cells here and there, not papillose, but the thickened walls of the apical cells giving an irregular outline to the cross-sections of the leaves; basal cells in one layer, more distinct, oblong or quadrate, .013–.021 mm. in diameter. Dioicous, only male plants collected, antheridia large, bright yellow, with or without paraphyses.

On rocks, Tuckerman's Ravine, Mt. Washington, N. H., alt. 1,230 m. July 30, 1890. Collected by Dr. Alexander W. Evans of Yale University, to whom this species is dedicated in recognition of his services to American bryology.

Dr. Evans' specimens have been compared with *Grimmia caespiticia* (Brid.) Jur. (*G. sulcata* Sauter) and with Limpricht's description and figures (Rab. Kryptfl. **4**: 2, 778, fig. 203). Though closely resembling this species in the form and structure of the leaves, ours lack the two prominent folds of the European species and the plants are coarser and more loosely tufted. Dr. Breidler kindly sent me specimens from the Austrian Alps for comparison and I hereby tender him and Mr. J. F. Collins my thanks, the drawings having been made by Mr. Collins.

Explanation of Plate 7. — *Grimmia Evansi:* fig. 1, outlines of three foliage leaves, enlarged 12 diameters; fig. 2, perigonal leaves, flattened and torn on account of being very concave, enlarged 12 diameters; fig. 3, apical cells of one leaf with a hyaline tip; fig. 4, median cells; fig. 5, basal cells; fig. 6, alar cells; figs. 7 and 8, cross-sections of leaves, showing irregular bistromatic cells. Figs. 3 to 8 are enlarged 330 diameters.

NEW FORMS OF GREEN ALGAE.[1]

N. Wille.

Microspora amoena (Kuetz.) Rab., forma **crassior,** n. form. Cells 30–32 μ diam. — Pequonnock River, Bridgeport, Conn., April 22, 1894, in company with the type; collected by Isaac Holden.

Rhizoclonium lacustre Kuetz. forma **Americana,** n. form. Cells not swollen, with thin walls and very scanty rhizoids. Cells 15–16 μ wide, 15–60 μ long. — Attached to stones, and growing to a length of one half meter to one meter, Bridgeport, Conn., July 25, 1892; collected by Isaac Holden.

[1] The forms here described, with a number of others, all of which were intended for distribution in Collins, Holden, and Setchell, Phycotheca Boreali-Americana, were submitted to Professor Wille for revision, and these two forms and one species from New England were determined by him to be new. They will be distributed in Fascicle XIII, which will appear some time in 1899. — F. S. Collins.

Elakatothrix Americana, n. sp. Forming gelatinous, laciniate and anastomosing masses, several cm. long, attached to other plants. Cells more oval than in *E. gelatinosa* Wille; the cell divides across the middle, but the daughter cells grow obliquely past each other, causing irregularity in the structure of the thallus. Length of cells 12–25 μ; breadth 6–11 μ. — Found at Monroe, Conn., May 30, 1895; collected by Miss Grace Angeline Smith.

Christiania, Norway.

FURTHER NOTES ON NEW ENGLAND ANTENNARIAS.

M. L. Fernald.

The Antennarias, it may well seem, have received during the past two years more than their share of attention in the literature of American systematic botany; yet so active have been three New England botanists during the past May and June that much more has been added to our knowledge of that group. In Vermont President Ezra Brainerd, of Middlebury College, has made an exceedingly thorough study of the plants in the field; while Mr. W. W. Eggleston of Rutland, Vermont, and Mr. J. C. Parlin of North Berwick, Maine, have both made critical notes and collections. These careful observations have extended the known ranges of many formerly recognized New England species, and in Maine and Vermont a novel plant with marked and apparently constant characters has been collected. The following notes based primarily upon the collections above referred to may be considered supplementary to the two papers already published upon the genus Antennaria in New England.[1]

Antennaria ambigens (*A. arnoglossa*, Greene, var. *ambigens*, Greene, Pittonia, iii. 320; *A. Parlinii*, Fernald, var. *ambigens*, Fernald, Proc. Bost. Soc. Nat. Hist. xxviii. 244). This plant formerly given only varietal recognition is now elevated without hesitation to specific rank. Though it bears some purple glands like those of *A. Parlinii*, in all its other characters — the dull pubescent upper surfaces of the basal leaves, the arachnoid glandless upper faces of the cauline ones, and the subcapitate inflorescence — it differs strikingly from that species. In

1 Proc. Bost. Soc. Nat. Hist. xxviii. 237–249; Rhodora, i. 71–75.

its subcapitate inflorescence of large heads it more nearly resembles Professor Greene's *A. Farwellii;* but that species is quite glandless and its basal leaves are characteristically narrower than those of *A. ambigens.* This species, too, is near *A. fallax*, Greene, but that is a much taller glandless plant with more scattered cauline leaves and looser corymbs.

A. FALLAX, Greene. In a recent note (RHODORA i. 74) I included under this species a number of northern New England specimens. More recently, however, I have been able to examine one of Professor Greene's specimens, which is well matched by a New England plant, though not by all the specimens formerly cited by me. At that time I took for *A. fallax* a plant with the basal leaves as green and generally as glabrous as those of *A. Parlinii.* True *A. fallax*, however, has the basal leaves definitely gray-pubescent above, and the greenish or tawny (not purple) involucral bracts have scarious or petaloid tips. This plant has been examined from the following New England stations, the central Maine specimens formerly referred to *A. plantaginea* belonging here: — MAINE, gravelly bank, Orono, June 7, 1897 (*Geo. B. Fernald*); rich grassy slope, Orono, June 3, 1898 (*M. L. Fernald*, no. 2346); North Berwick, May 30, 1899 (*J. C. Parlin*, no. 1149): NEW HAMPSHIRE, roadside thickets, Jaffrey, May 31, 1897 — remarkably large specimens (*E. L. Rand* and *B. L. Robinson*, nos. 414, 415): VERMONT, in partial shade, Weybridge, May 21 and June 1, 1899, low open woods, in clay soil, Ferrisburgh, June 4, 1899 (*Ezra Brainerd*, nos. 15, 16): MASSACHUSETTS, dry pine woods, Wilmington, June 11, 1899 (*G. G. Kennedy*).

The plant with bright green leaves, formerly confused with *A. fallax* appears, upon an examination of more material, to belong rather with *A. Parlinii*, var. *arnoglossa.* The specimens referred to *A. fallax* were quite glandless, a character which, at that time, was considered sufficient to separate the plant specifically from *A. Parlinii.* Abundant material recently examined shows, however, that occasionally a few glands occur, and that, with no other characters to distinguish it, the plant must be considered

A. PARLINII, var. ARNOGLOSSA, Fernald, Proc. Bost. Soc. Nat. Hist. xxviii. 244. New England specimens examined: — MAINE, sandy field, Milo Junction, June 6, 1898, gravelly bank, Orono, June 4, 1898 (*M. L. Fernald*, nos. 2344, 2342, 2345); Somesville, July 2, 1897 (*E. L. Rand*); North Berwick, May 28, 1899 (*J. C. Parlin*): NEW

Hampshire, hillside, Jaffrey, May 31, 1897, — leaves arachnoid above (*E. L. Rand* and *B. L. Robinson*, no. 424): Vermont, Willoughby, June 10, 1898 (*G. G. Kennedy* and *E. F. Williams*); low open woods, Ferrisburgh, June 4, 1899; roadside, Waltham, May 21, 1899, roadside, Weybridge, May 23 and June 3, 1899, New Haven Mills, May 25, 1899, Addison, May 27, 1899, Chipman Hill, Middlebury, May 31, 1899 (*Ezra Brainerd*, nos. 14, 48, 52, 54, 56, 59): Massachusetts, Williamstown, June, 1898 (*J. R. Churchill*): Connecticut, wooded bank, New Haven, May 17, 1898 (*A. W. Evans* and *M. L. Fernald*).

A. Farwellii, Greene, Pittonia, iii. 347. Professor Greene based this species upon a very immature specimen collected in northern Michigan by Mr. O. A. Farwell. Better developed specimens sent from Michigan by Professor C. F. Wheeler have been identified with one of Mr. Farwell's specimens, and there is little doubt that this is the plant which has been collected at various stations in northern New England and Canada.

The species may be briefly characterized as follows: Stems stout, mostly rather low, occasionally 3.5 or 4 dm. tall: basal leaves 4.5 to 8 cm. long, gray above with nearly permanent pubescence, spatulate or narrowly obovate-spatulate, with rounded tips, conspicuously 3-nerved; cauline leaves from lanceolate to oblanceolate, usually rather conspicuous: inflorescence subcapitate, or the heads on only short pedicels: involucre 8 to 10.5 mm. high, the bracts about 3-seriate, from lanceolate to oblong, with conspicuous white tips, the outer obtuse, broader than the inner bluntish or acute ones. In New England known from Maine, dry sterile soil, North Berwick, June 4, 1899 (*J. C. Parlin*, no. 1157): New Hampshire, barren ledges in open woods, lower slopes of Mt. Deception, Fabyan, June 20, 1898 (*E. F. Williams*); Alstead, July 4, 1898 (*M. L. Fernald*): Vermont, abundant about Middlebury, May 20, 1880, May and June 1898, 1899 (*Ezra Brainerd*, nos. 29, 30, 39, 42, 46, etc.); New Haven, May 21, 1899; Cornwall, May 23, 1899; Addison, May 27, 1899 (*Ezra Brainerd*, nos. 31, 34, 37); Rutland, June 2, 1899 (*W. W. Eggleston*). Also examined from Ontario, fields about Ottawa, June, 1898 (*J. M. Macoun* in Herb. Can. Geol. Surv. no. 18,809), and from Michigan, sterile fields and bluffs, Keweenaw Co., April, 1884 (*O. A. Farwell*); campus, Agricultural College, June 9, 1898 (*C. F. Wheeler*). A very handsome and well-marked species, in habit nearest resembling *A. ambigens*, but quickly distinguished from that by its basal leaves, etc. (see above).

A. Brainerdii. With the habit of true *A. plantaginea* (*A. decipiens*, Greene); the stems slender and mostly rather low, 2 or 3 dm. high, bearing purplish glandular hairs mixed with the white flocculent indument: basal leaves dull, almost permanently arachnoid-pubescent above, the older sometimes becoming glabrate, obovate to orbicular-obovate tapering gradually to a slender petiole and, including it, 1.5 to 4.5 cm. long, 0.75 to 2 cm. broad; cauline leaves scattered, linear-lanceolate, small, arachnoid above: heads corymbose as in *A. Parlinii:* involucre 6 or 8 mm. high, the bracts 3-seriate, white-tipped, the outermost oblong, blunt, green or tawny and lanate below, the innermost attenuate. In clay soils, VERMONT, Barber's meadow, Addison, May 27, 1899, north of Birch Hill, New Haven, June 2, 1899, open meadows, New Haven, June 3, 1899, low woods, Ferrisburgh, June 4, 1899 (*Ezra Brainerd*); Bald Mt., Shrewsbury, alt. 460 m., June 6, 1899 (*W. W. Eggleston*): MAINE, dry open hickory and pine woods, and on a sandy exposed bank, North Berwick, June 4, 1899 (*J. C. Parlin*, nos. 1170, 1155). In general aspect this plant suggests a very small *A. plantaginea,* but the basal leaves are much smaller than is usual in that plant or in the related species, *A. Parlinii, A. fallax,* and *A. ambigens.* In foliage alone it has an equally strong resemblance to *A. neodioica,* the pubescent basal leaves being no larger than in the well developed plants of that species. From *A. plantaginea* it is further distinguished by the very abundant purple glandular hairs, like those of *A. Parlinii,* and by its larger heads with broad white-tipped bracts. To *A. Parlinii, A. Brainerdii* bears but little superficial resemblance, the small, dull, arachnoid-pubescent basal leaves, the small more scattered arachnoid, not glandular, cauline ones rendering it habitally very different, although in its bracts it is very close to *A. Parlinii,* var. *arnoglossa.* From *A. ambigens,* too, this species differs strikingly in its small basal leaves, and its very much smaller and more scattered cauline ones. Its nearest ally perhaps is *A. fallax,* but that is generally a much taller plant with larger leaves, glandless stem, and much narrower and more scarious involucral bracts.

Since the publication in 1898 of my synopsis of the New England Antennarias, such modification and expansion of the treatment there presented has been necessary that the following key to the species as now understood will perhaps be of some service: —

Stolons assurgent.
- Basal leaves and those at the tips of the stolons bright green above, glabrous from the first, or at most only slightly arachnoid when very young, soon quite glabrate.
  - Basal leaves large, 5 to 12 cm. long, broadly obovate or obovate-spatulate, obtuse or rounded at tips.
    - Stems and stolons bearing many purplish glandular hairs: cauline leaves very glandular above: involucral bracts all scarious, mostly acute, the inner long-attenuate . . . . . *A. Parlinii.*
    - Glands generally fewer or absent: outer bracts with broad white petaloid tips, the inner acute, but not so attenuate, *A. Parlinii,* var. *arnoglossa.*

Basal leaves small, 2 to 5 cm. long, spatulate or obovate-spatulate, acute or obtuse.

Bracts linear or linear-lanceolate, chartaceous below, petaloid or scarious above, the outer acute or obtuse, the inner attenuate, *A. canadensis.*

Bracts linear-oblong, with broad white petaloid tips . . . . *A. canadensis*, var. *Randii.*

Basal leaves and those at the tips of the stolons dull above, invested with tomentose or arachnoid pubescence, only the very oldest leaves becoming glabrate.

Basal leaves mostly long, 5 to 12 (in reduced specimens rarely 4.5) cm. in length. (Large specimens of *A. Brainerdii* might be looked for here.)

Heads comparatively small, involucre averaging 7 (6 to 8) mm. high: stems slender.

Basal leaves obovate, with rounded or obtuse tips . *A. plantaginea.*

Basal leaves from obovate-spatulate to oblanceolate, with acute or acutish tips . . . . . . *A. plantaginea*, var. *petiolata.*

Heads comparatively large, averaging 9 (8 to 10.5) mm. high: stems stouter.

Basal leaves mostly broadly obovate or rhombic-obovate, tapering gradually to blunt or acutish tips.

Stems 1 to 2.5 dm. high, bearing some purple glandular hairs above: cauline leaves rather crowded, nearly or quite to the subcapitate inflorescence . . . . . *A. ambigens.*

Stems taller, 2.5 to 4 dm. high, not glandular: cauline leaves rather remote . . . . *A. fallax.*

Basal leaves from spatulate to narrowly obovate-spatulate, with rounded tips . . . . *A. Farwellii.*

Basal leaves small, 2 to 5 cm. long. (*A. petaloidea* with slightly developed stolons might be looked for here.)

Basal leaves spatulate, with little or no differentiation of blade and petiole: involucre lemon-tinged . . . . . *A. rupicola.*

Basal leaves with more distinct petioles and obovate blades: involucre not lemon-tinged.

Stems bearing purple glandular hairs . . . *A. Brainerdii.*

Stems without glands.

Cauline leaves linear-attenuate, rather small and inconspicuous, 3 mm. or less wide: involucral bracts with scarious tips.

Outer bracts obtuse . . . . *A. neodioica.*

All the bracts long-attenuate . *A. neodioica*, var. *attenuata.*

Cauline leaves oblanceolate or oblong-lanceolate, larger and more conspicuous, 5 to 8 mm. wide: bracts with petaloid tips . . . . *A. neodioica*, var. *grandis.*

Stolons, when well developed, procumbent: basal leaves from cuneate-spatulate to obovate, 4 (rarely 5) cm. or less in length.

Heads in a comparatively loose corymb.

Involucral bracts with conspicuous blunt or acutish petaloid white tips . *A. petaloidea.*

Involucral bracts scarious, long-attenuate . *A. petaloidea*, var. *scariosa.*

Heads sessile or subsessile in subcapitate clusters, or distinctly racemose . *A. neglecta.*

The very large number of specimens recently examined from various parts of New England fall so readily within the defined limits of the species here enumerated, that, although it may yet be necessary to recognize some minor forms, confidence is felt that a very satisfactory

disposition of the northeastern species is now being attained. In view of this fact, it is perhaps appropriate that a summary of our knowledge of the distribution of these plants in New England should now be made. The check-list of species which follows on page 160 will show very quickly that in northern New England the genus *Antennaria* reaches a greater development than further southward. Some of the species, however, now known only from the northern states are to be expected from the other three, while a few forms may yet be expected in Maine, New Hampshire and Vermont. It is hoped that any information (especially if accompanied by specimens) which will further our understanding of these plants will be sent to the writer, who, so far as he is able, will gladly render assistance in the identification of species.

Gray Herbarium.

Subularia aquatica on Mt. Desert Island. — This small and easily overlooked aquatic crucifer is doubtless neither so rare nor so local in its distribution as has been commonly supposed. Stations where it is known to occur, however, are not yet so numerous, that a new one is without interest. In September, 1895, the late Edwin Faxon and I made a careful exploration of the shores of many of the ponds on Mt. Desert Island for *Isoetes* and other water plants, hoping that *Subularia* also might reward our search; and in fact we were successful in finding it in two of the ponds. It was growing both immersed on the sandy shores, and out of water in the mud among stones, and was at the time of collection, in flower as well as in fruit. At the station on Eagle Lake, the immersed plant was in great abundance. Comparatively little of it grew in the clear sand, however, most of the colony being anchored in a great mat of *Juncus militaris*, *Eriocaulon septangulare*, and *Lobelia Dortmanna*. The economy of this manner of living may be readily understood when one notices how easily these little plants are uprooted from the sand by the waves at the time of low water. Only a few emersed plants were found, in fact all the plants here observed would be at least three feet under water the greater part of the year. Since the above observations were made, however, the level of the lake has been raised two to three feet, so that collecting at this station has become very difficult.

At the other pond much the same habits have been observed. More plants, however, grow in the sand and gravel; and a number of

them grow emersed in mud on the shore a little below high water mark. These latter plants, however, are very small, with short, contracted scapes, bearing usually only a few flowers.

My observations during the last few years lead me to conclude that *Subularia* reaches its best development in more than one foot of water at the summer level of the pond, unless in some way anchored in mats of other aquatic plants, to secure protection from uprooting in rough water. — E. L. Rand.

The staminate plant of Antennaria Parlinii — It may be of interest to some of the many readers of Rhodora to know that the staminate form of *Antennaria Parlinii*, Fernald, has been found. On May 28, along the banks of the Newichawannick river, North Berwick, Maine, in a large bed of *A. Parlinii*, *A. Parlinii, var. arnoglossa* and *A. plantaginea, var. petiolata*, I found just four staminate plants, whose large basal leaves and shoots, brittle, succulent stems, and glandular pubescence, proclaimed them to be the long sought male form of *A. Parlinii*. The few heads, on short pedicels, were in a small corymb 1.5 cm. broad. The bracts, in a single series or obscurely 2-seriate, were oblong, green and herbaceous, with white, or pink and white, erose tips.

The extreme scarcity of the staminate plant seems to leave the question of the general fertilization of the species still unsolved. — John C. Parlin, North Berwick, Maine.

Morchella bispora. — In his synopsis of the Vermont Helvelleae in the April Rhodora, Dr. E. A. Burt calls attention to the possibility of extending the range of *Morchella hybrida* Pers. (= *M. semilibera* DC.), known in New England only from Massachusetts. A further suggestion of the same kind may well be made in regard to the much rarer *Morchella bispora* Sor. Both these fungi belong in the division of the genus characterized by having a free limb to the cap (genus *Mitrophora* Lév.), and are thus easily recognized in the field. Without microscopic examination, however, *M. bispora* might readily be overlooked, and the collection, in consequence, credited to the former species; for, although *M. bispora*, as can be well seen in a vertical section, has a cap free very nearly to the top of the stem, in contrast

to the half-free cap of the other which is signalized by Persoon's name *hybrida* and still better by De Candolle's *semilibera*, the two species are even better distinguished by the number and size of the spores. In *M. hybrida*, the asci contain the usual eight spores, in *M. bispora* only two — by compensation very large.

M. bispora is apparently quite unknown in New England, though it was found some years ago as near as Oneida, New York.[1] A recent collection (April, 1899), was made near Plainfield, N. J., by Mr. E. H. Mumford. The plants in very small number were found in chestnut woods among dead leaves near the edge of a swamp, Erythronium being close by in flower. The caps were light olive and the hollow stems nearly white. In the dried state the vertical (or radial) ridges on the cap are very conspicuous, and the stem has a more or less pronounced red tint, which is deeper in the younger specimens. The spores are 60 to 65 by 15 μ. Figures and descriptions of both species here mentioned may be found in Cooke's Mycographia (nos. 321, 326), and in the 48th Report of the New York State Museum (p. 126, pl. 3). — H. Webster.

Hydrastis Canadensis, L., a New England plant. — It has long been known to a few persons that the "Golden Seal," as it is commonly called, could be found growing in rocky woods in the neighborhood of Southington, Connecticut. The plant is of rare occurrence here and the secret of its exact location has been carefully guarded. Neither Gray's Manual, the Synoptical Flora, nor Britton & Brown's Illustrated Flora, mentions the occurrence of the plant so far east. I have reliable information that the species was growing here twenty-seven years ago, and specimens, one of which has been deposited in the Gray Herbarium, have been secured as late as 1897. It is not unlikely that search may reveal other stations in western New England for this interesting and easily recognized plant. — C. H. Bissell, Southington, Conn.

1 C. H. Peck, 30th Rep. N. Y. St. Mus., p. 58.

THE LOCAL FLORAS OF NEW ENGLAND.

Mary A. Day.

(Continued from p. 142.)

Massachusetts.

General Works: —

134. **Stone, George Edward.** Massachusetts weeds. Mass. Crop Rep. September, 1897, pp. 28–35. Annot. catalog. *phaenog.* M. H.

135. **Orchids of Massachusetts.** Worcester Gazette, 1893. Annot. catalog. *phaenog.* Dr. Stone's library. Not seen.

136. **Tuckerman, Edward.** Notice of some Cyperaceae of our vicinity. Hovey's Mag. vii. 1841, pp. 208–210. Select. spec., popular treatm. *phaenog.*

137. —— and **Frost, Charles Christopher.** A catalogue of plants growing without cultivation within thirty miles of Amherst College. Amherst, 1875, pp. 98. Annot. catalog. *phaenog.* and *cryptog.*

138. **West, William.** List of desmids from Massachusetts, U. S. A. Jour. Roy. Micros. Soc. Lond. 1889, pp. 16–21. Annot. catalog. *cryptog.* N. H.

139. **Williams, Stephen Wells.** On the indigenous medical botany of Massachusetts. Trans. Am. Med. Assoc. ii. 1849, pp. 863–927. Annot. catalog. *phaenog.* and *cryptog.* H. C.

Barnstable County: —

140. **Deane, Walter.** A few Cape Cod plants. Bot. Gaz. xiv. 1889, pp. 45–47. Select. spec., popular treatm. *phaenog.*

141. **Russell, Harry Luman.** The bacterial flora of the Atlantic Ocean in the vicinity of Wood's Holl, Mass. Bot. Gaz. xviii. 1893, pp. 383–395, 411–417, 439–447. Illus. Annot. catalog. *cryptog.*

Berkshire County: —

142. **Chadbourne, Paul Ansel.** Natural history catalogue for Williamstown, Mass. Williams Quarterly, v. No. 4, 1858, pp. 342–359. List. *phaenog.* and *vasc. cryptog.*

Pages 347–356 contain a list of plants.

143. **Dewey, Chester.** Catalogue of plants found in the county of Berkshire, Mass. In History of the County of Berkshire, by Gentlemen in the County; pt. 1, by Chester Dewey. 1828, pp. 43–86. Annot. catalog. *phaenog* and *cryptog.* B. P.

(To be continued.)

PRELIMINARY LISTS OF NEW ENGLAND PLANTS,— II. UMBELLIFERAE.[1]

WALTER DEANE.

[The sign + indicates that an herbarium specimen has been seen; the sign — that a printed record has been found.]

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Aegopodium Podagraria, L.				+	+	—
Aethusa Cynapium, L.				+	+	—
Angelica atropurpurea, L.	+	+	+	+	—	+
" hirsuta, Muhl.						+
Berula angustifolia, Koch				—		
Biflora radians, Bieb.					+	
Bupleurum Odontites, L.				+		
" rotundifolium, L.		+		+		—
Carum Carui, L.	+	+	+	+	+	+
Cicuta bulbifera, L.	+	+	+	+	+	+
" maculata, L.	+	+	+	+	+	+
Coelopleurum Gmelini, Ledeb.	+	+		+	—	
Conioselinum canadense, Torr. & Gray	+	+	+	+		
Conium maculatum, L.	+	+	+	+	+	—
Crantzia lineata, Nutt.				+	+	+
Cryptotaenia canadensis, DC.		+	+	+	+	+
Daucus Carota, L.	+	+	+	+	+	+
Discopleura capillacea, DC.				+	+	+
Eryngium aquaticum, L. (*E. yuccaefolium*, Michx.)						+
Foeniculum vulgare, Gaertn.						+
Heracleum lanatum, Michx.	+	+	+	+	+	+
Hydrocotyle americana, L.	+	+	+	+	+	+
" umbellata, L.				+	+	—
" verticillata, Thunb.				+		
Levisticum officinale, Koch			+			+
" scoticum, L.	+	+		+	+	+
Osmorrhiza brevistylis, DC.	+	+	+	+	+	+
" longistylis, DC.	+	+	+	+	+	+
Pastinaca sativa, L.	+	+	+	+	+	+
Pimpinella Anisum, Willd.				—		
" integerrima, Gray			+		—	+
Sanicula canadensis, L.			+	—		+
" gregaria, Bicknell			+	+		+
" marilandica, L.	+	+	+	+	+	+
" trifoliata, Bicknell			+	+		
Sium Carsonii, Durand	+	+		+	+	+

1 Printed in RHODORA as supplementary material.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Sium cicutaefolium, Gmelin	+	+	+	+	+	+
Thaspium atropurpureum, Nutt.					—	
" barbinode, Nutt.						—
Zizia aurea, Koch	+	+	+	+	+	+
" cordata, DC.					+	+

PRELIMINARY LISTS OF NEW ENGLAND PLANTS, — III. ANTENNARIA.[1]

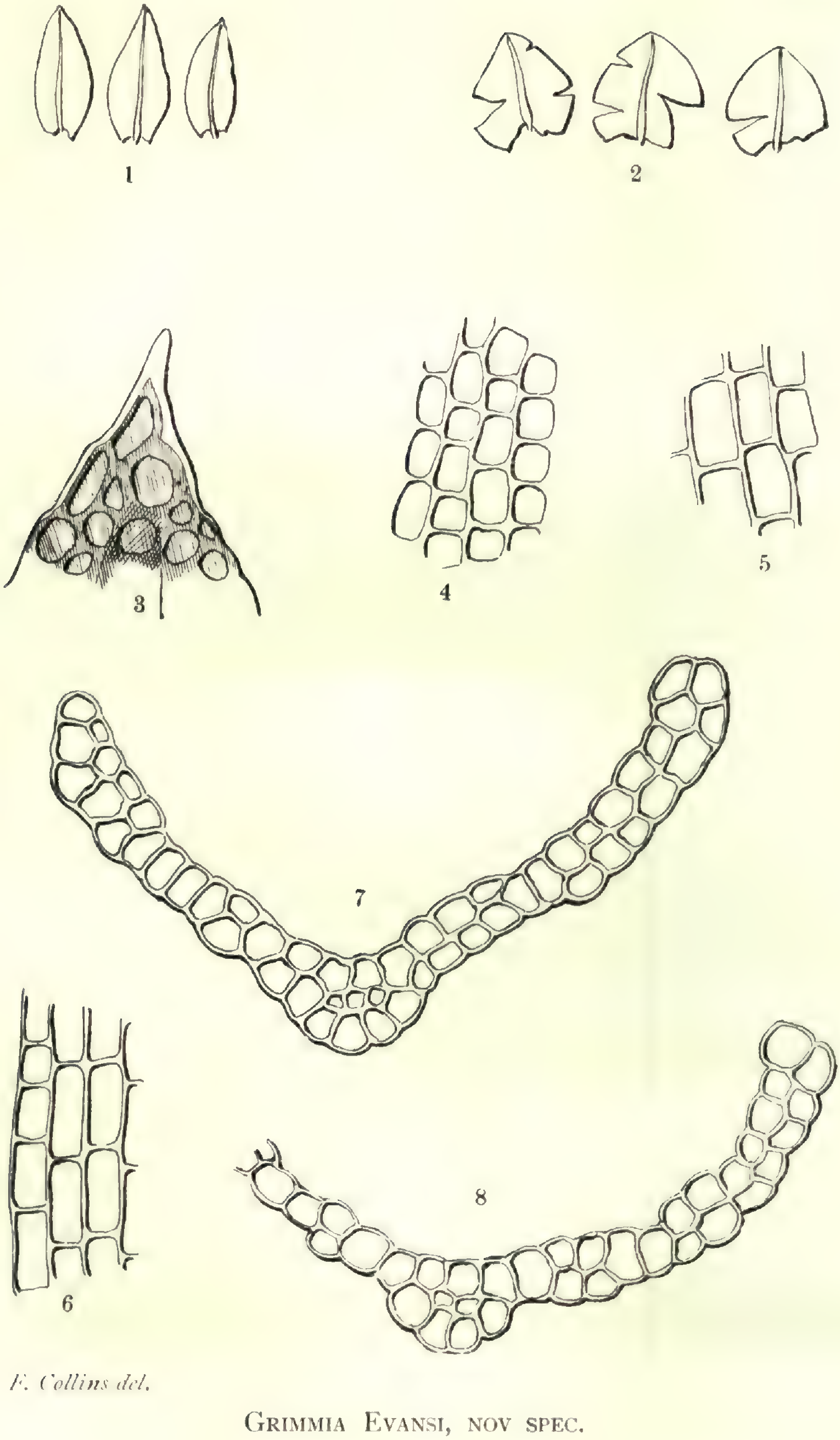
M. L. Fernald.

[**The sign + indicates that an herbarium specimen has been seen; the sign — that a printed record has been found.**]

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Antennaria ambigens, Fernald	+			+	+	+
" Brainerdii, Fernald	+		+			
" canadensis, Greene	+	+	+	+		
" " var. Randii, Fernald .	+		+			
" fallax, Greene	+	+	+	+		
" Farwellii, Greene	+	+	+			
" neglecta, Greene	+	+	+	+	+	+
" neodioica, Greene	+	+	+	+	+	
" " var. attenuata, Fernald .	+	+	+			+
" " var. grandis, Fernald .	+		+			
" Parlinii, Fernald	+	+	+	+		+
" " var. arnoglossa, Fernald .	+	+	+	+		+
" petaloidea, Fernald	+	+	+			
" " var. scariosa, Fernald .	+					
" plantaginea, R. Br.		+	+	+	+	+
" " var. petiolata, Fernald .	+	+	+	+	+	+
" rupicola, Fernald	+					

[1] Printed in Rhodora as supplementary material.

Vol. 1, No. 7, including pages 121 to 142 and plate 6, was issued July 1, 1899.



J. F. Collins del.

GRIMMIA EVANSI, NOV SPEC.

Rhodora

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NOTES ON THE SPECIES OF AGARICUS (PSALLIOTA) OF THE CHAMPLAIN VALLEY.

CLAYTON O. SMITH.

EIGHT species of Agaricus have been thus far found in the Champlain Valley. The more abundant of these are *Agaricus arvensis* and *A. silvicola;* others found less often are *A. comtulus, A. campester, A. diminutivus, A. placomyces,* and *A. silvaticus. A. Rodmani* seems to be quite local, but when found is often abundant. Four of these species are especially noteworthy by reason of their rarity, or because they are so likely to be confounded with more common or better known species.

AGARICUS RODMANI Pk. Pileus rather thick, firm, at first convex, then nearly or quite plane, with decurved margin, smooth or rarely slightly rimose-squamose on the disk, white or whitish, becoming yellowish or subochraceous on the disk, the flesh white, unchangeable; lamellae close, narrow, rounded behind, free, reaching nearly or quite to the stem, at first white, then pink, or reddish-pink, finally blackish-brown; stem short, subequal, solid, whitish, smooth below the annulus, often furfuraceous or slightly mealy-squamulose above; annulus variable, thick or thin, entire or lacerated, at or below the middle of the stem; spores broadly elliptical or subglobose, generally uninucleate, 5-6 x 4-5 μ. Plant 5-7 cm. high; pileus 5-10 cm. broad; stem 12.5-21 mm. thick.

Agaricus Rodmani is allied to *A. arvensis,* from which it may be most readily distinguished by its short, thick, solid stem, double annulus, and smaller spores. The double annulus, in the mature plant, is separated by a groove into two projecting entire parts. Sometimes the annulus is near the base of the stem and then suggests a volva. *A. arvensis* has a hollow and longer stem. The annulus is also double, but the two portions are in close contact and joined along the surface of contact. The upper part is entire; the lower is radiately divided, being cut into stellate white or yellowish rays. The spores of *A.*

arvensis are elliptical 6-10 x 5-6.5 μ. Those of *A. Rodmani* are usually subglobose.

Agaricus Rodmani has sometimes been regarded as a form of *A. campester* [*A. campestris L.*]. It differs from it, however, in having the flesh of the pileus thicker and firmer, the lamellae narrower and at first whitish, then pink, and the spores subglobose, while those of *A. campester* are elliptical and of nearly the same size as those of *A. arvensis*.

Agaricus comtulus Fr. Pileus somewhat fleshy, plane to convex or obtuse, adpressedly fibrillose-silky, smooth, with thin soft flesh, becoming white; lamellae free, rounded behind, crowded, soft, broader in front, flesh-color then rose, but not fuscous-flesh-color unless mature; stem hollow, when young stuffed with floccules, subattenuated, even, glabrous, white, becoming somewhat yellowish; annulus medial, torn, fugacious, of the same color as stem; spores elliptical, 4.5 x 3.6 μ. Pileus 2.5-3.75 cm. broad; stem 2.5-5 cm. long, 4-6 mm. thick.

Agaricus comtulus has its pileus white, sometimes cream colored toward the disk; the lamellae exceed the pileus and change color with age; the stem has a somewhat enlarged base, and changes color to a light yellow. The only specimens I have seen were found growing in thin grass under shrubbery by Dr. E. A. Burt. This species differs from *A. campester* in having a thinner pileus, shorter stem, and smaller spores 4.5 x 3.6 μ. while those of *A. campester* are 6.5-7.5 x 4.5 μ. The lamellae are more beautiful in color than those of *A. campester*.

Agaricus diminutivus Pk. Pileus thin, fragile, at first convex, then plane or centrally depressed, sometimes slightly umbonate, whitish or alutaceous, faintly spotted with small, thin, silky appressed brownish scales, the disk brownish or reddish-brown; lamellae close, thin, free, ventricose, brownish-pink, becoming brown, blackish-brown or black; stem equal or slightly tapering upwards, stuffed or hollow, smooth, pallid; annulus thin, persistent, white; spores elliptical 5 x 3.5-4 μ. Plant 3.5-5 cm. high, pileus 2.5-3.5 cm. broad, stem 2-4 mm. thick.

Agaricus diminutivus is about the same size as *A. comtulus* and in some respects is perplexing to separate from it. The color seems to differ in the two. *A. comtulus* has a yellowish pileus; that of *A. diminutivus* is of a reddish hue, usually, becoming paler near the margin, but sometimes uniformly tinged with red. The lamellae differ in the two species. Those of *A. comtulus* are flesh-color, then rose, and change to a fuscous flesh-color only when old, while the lamellae of *A. diminutivus* are brown or pinkish brown. The pileus of *A. comtulus* is soft-fleshed and fibrillose-silky. *A. diminutivus* has a fragile

pileus and bears thin reddish-brown scales. The annulus of *A. diminutivus* is thin and persistent, that of *A. comtulus* is torn and often falls off.

Agaricus placomyces Pk. Pileus fleshy but rather thin, at first convex or campanulate, then expanded and quite plane, squamulose, whitish, the disk and minute scales brown; lamellae close, free, white, then pinkish, finally blackish-brown; stem smooth, stuffed with a small pith, slightly tapering upward, bulbous, whitish, the bulb stained with yellow and usually giving rise to one or two mycelioid white root-like processes; annulus large, flabby; spores elliptical, 5-6 x 4-4.5 μ. Plant 7.5-12.5 cm. high, pileus 5-10 cm. broad, stem 4-8 mm. thick.

Agaricus placomyces is readily recognized by the numerous brown scales with which the pileus is thickly covered. These are more abundant near the center, forming there a dark brown spot. The pileus, as contrasted with these scales, is of a whitish color, passing sometimes into shades of mouse and ash color. It is quite thin-fleshed, and when young, is bell-shaped as is also the large, thin, flabby annulus; but both become flatter with age. The lamellae are white, passing through the various shades of pink with advancing age, and at length reaching their normal color, brown. The stem is hollow or stuffed and rather long and tapering, bearing near its top the annulus. The plant grows in thin coniferous woods. My collection was made in September from a cedar grove of quite large trees. Many plants were found the first time, but afterwards few new ones grew. There was apparently but one crop.

Agaricus silvaticus is very rare. The only specimens I have seen were collected by Dr. Burt. The pileus is thin, gibbous or umbonate and somewhat variable in color, being whitish, brownish or smoky gray. It is covered by feebly persisting, innate, reddish-brown squamules; but at length it may become free from scales. The even stem is lighter in color than the pileus, and bears the thin membranaceous and sometimes fugacious annulus at about two-thirds the distance from the slightly enlarged base. The stem is stuffed, at least, in young plants, but finally becomes hollow. The lamellae are at first cinnamon-color but become fuscous-purplish. The plant is usually found in woods.

Agaricus silvicola bears some resemblance to *A. arvensis*, for in our American plant there seems to be a somewhat double or lacerated annulus. It differs from *A. arvensis*, however, by growing in woods, and in having a flattened turnip-like bulb. It is larger than *A.*

campester, has white lamellae in its young stage, while those of *A. campester* are pink. The pileus is also larger and smoother. The best marks by which to recognize it are its peculiar characteristic bulb and its stuffed or hollow, long, tapering stem.

Middlebury College, Middlebury, Vt.

[As it is not unlikely that readers of Mr. Smith's article on species of *Agaricus* may use it as a guide to make sure of the common edible pasture mushroom (*A. campestris* L.), it may be well to add that of the other species mentioned the following are beyond question edible: *A. arvensis*, *A. silvicola* and *A. Rodmani*. It is important to state, however, that *A. comtulus* has a bad reputation; and further that cases of illness have been reported from eating fungi that closely resemble *A. placomyces*, although the identity of these noxious forms cannot be precisely stated with the information at hand. — Ed.]

ADDITIONS TO THE FLORA OF AMHERST, MASSACHUSETTS.

Hubert Lyman Clark.

It is now nearly twenty-five years since the appearance of the last edition of Professor Tuckerman's Catalogue of Plants growing without cultivation within thirty miles of Amherst College. Since that time a number of plants have become fairly common in Amherst which were then unknown there, most of them having been introduced as "weeds." Since 1890, I have spent four seasons wholly or in part botanizing around Amherst, and the following flowering plants have come under my notice which are not given in Tuckerman's list. The nomenclature used is that of the sixth edition of Gray's Manual.

1. *Coronilla varia*. Quite common in the last few years in several roadside fields about town.

2. *Amorpha fruticosa*. Abundant by the roadside near the "Colonel Clark" place.

3. *Callitriche heterophylla*. Collected in a pool on the east side of Mt. Warner in May, 1899.

4. *Carum carui*. Quite common by the roadsides in Leverett in 1899.

5. *Onopordon acanthium*. Found near the Agricultural College in the summer of 1890.

6. *Hieracium aurantiacum*. Not rare in 1890 in the lawn near the plant-house at the Agricultural College.

7. *Lysimachia nummularia*. Now a common and, in some places, troublesome weed.

8. *Pentstemon pubescens*. Near East Amherst in 1890.

9. *Plantago patagonica gnaphalioides.* A common weed near the Agricultural College in 1890.

10. *Rumex sanguineus.* Not uncommon.

11. *Pogonia affinis.* A single specimen of this rare orchid was found on the north side of the Holyoke range about three-fourths of a mile from the "Notch" and six or seven hundred yards from the "Old Bay" road, May 31, 1899. A number of specimens of *P. verticillata* had been seen and one or two collected, but this specimen of *P. affinis*, though in similar soil, was several hundred yards from the nearest of them. It was growing on a dry wooded bank in the shade of hemlocks and was the only plant in that immediate vicinity. There were two dried stalks attached to the same root with the living one. The specimen answered perfectly to the description of *P. affinis* in the Manual and also to the figure and description in Britton and Brown's Illustrated Flora of the Northern States, etc., and was very obviously different from *P. verticillata*. To avoid any possible error, the specimen was sent to Dr. Robinson at the Gray Herbarium, who confirmed the identification. The specimen is now in that herbarium.

12. *Iris germanica.* A small patch of this handsome iris was found south of Mt. Toby, in a swampy bit of ground, on the west side of the Central Vermont railroad, very near the track, in June, 1899. The plant seemed thoroughly established and the large yellow and brown flowers were very conspicuous.

13. *Scirpus sylvaticus digynus.* Not at all uncommon in swampy places.

14. *Calamagrostis confinis.* Collected at Locks Pond in June, 1899.

15. *Eragrostis Purshii.* Quite common near the Central Vermont railroad tracks.

16. *Poa alsodes.* Collected several times in North Amherst in 1898 and in 1899.

The following plants are given in the list, but these additional notes concerning them may not be without interest.

Leontodon autumnale. Not at all uncommon now.

Moneses grandiflora. Collected in 1893, in pine woods on the north side of Mt. Toby.

Conopholis americana. A number of specimens were collected on Mt. Toby, in June, 1899.

Phalaris arundinacea picta. Quite a patch of this handsome grass is established in a bit of swampy ground beside the Sunderland road, about half a mile above North Amherst.

Amherst College.

SOME PLANT-NAMES OF THE MADAWASKA ACADIANS.[1]

M. L. FERNALD.

A LARGE portion of northern Maine and New Brunswick, and especially the region drained by the "upper" St. John — i. e. from the Grand Falls up river eighty miles to the mouth of the Allaguash — was long ago settled by Acadians. These people were largely those who came up the St. John after the pathetic expulsion of 1755 and first settled at the mouth of the Madawaska river. For a century and a half they have passed their simple out-door lives in comparative isolation. Travelling, as he has, principally in various forms of bateaux, the "canoe" and the "pirogue" or "dug-out," and depending largely upon fish and game for food, and upon native plants for both food and medicines, almost every "Madawaskan" has an intimate aquaintance with the common plants about him.

During two visits in this, to me, the most fascinating section of New England, I have been struck by this general familiarity with the plants and their uses. Ordinarily the temptation to spend all the available time exploring the fertile intervales and the wonderful river-beaches with their seemingly endless profusion of novelties has forced me to regard the collection of local plant-lore as of secondary importance. During the past June, however, it was my privilege to ride from Ashland to Fort Kent on the "mail stage," a one-seated buggy so loaded with baggage and express packages for "up-river," that after I had secured my seat, other applicants were turned away by the driver's reply, "Can bring him no more passengère: got some enough to-day already." This genial driver, with his delightful Madawaska English, is the best company imaginable for a long drive, especially if one is looking for information about the plants along his portion of the mail-route — the twenty-six miles from Ashland to the hill-top in Winterville. For an hour after I discovered what a mine of information he was, the good-natured driver and I exchanged Madawaska and Yankee plant-names. When we reached Portage Lake, however, he apparently decided that a little more crowding was preferable to being "worked" by me. At any rate, for the next eighteen miles I dangled both feet near the wheels, and the driver became so absorbed in the Evangeline

[1] These notes were presented at a recent meeting of the Josselyn Botanical Society of Maine (1898), as part of the report of the Committee on Plant-Lore.

for whom we had made room, that all my efforts to gain from him any more plant-names were utterly ignored.

The Madawaska names for many plants were interesting to me, and it is possible that in them others may also find something of interest. Many of them are identical with the French names for the same or related European plants, while others are apparent corruptions of the European names. Still other names of plants well-known in France are unique, and rarely they show distinct English or Algonkian influences. The following list is very short, but it will serve to call attention to an attractive study incident to a summer's collecting-trip; and it is hoped that it will be the nucleus about which further notes may be gathered. The spelling of the Madawaska names is kept as it was given by my informant, who was each time requested to spell the name, which would otherwise have been difficult to make out.

	MADAWASKA.	FRANCE. (Same or similar plant.)
Equisetum.	Le çail renard. (The Madawaska Acadians rarely give the hard sounds of *k* and *t*. Instead they give the sound of *ç* or *s*. This name, then, is partly of English origin: le *tail* renard.)	Prêle.
Smilacina racemosa.	Pied coq.	
Veratrum viride.	Labois, (An evident corruption of the French and English *Hellebore.*)	
Populus balsamifera.	Purnals.	Peuplier de la Virginie.
Salix.	Soild.	Saule.
Betula.	Boulon.	Bouleau.
Corylus.	Courts.	Coudrier.
Ranunculus acris.	Bouçet jaune. (Bouçet, corruption of *bouquet.* See *Equisetum.*)	Bouton d'or.
Pyrus americana and *P. sambucifolia.*	Moccoet. (Pronounced Mŭs-koo. In Quebec, according to Provancher, called *Maskou.* The Abnaki word for *bark* is *Mosku,* the Micmac, *Masku.* The Algonkian name may readily have been adopted by the Madawaska French for the Mountain Ash, whose bark is often used by them in tanning.)	Sorbier des oiseaux.

Prunus virginiana.	Scasacralb. (Perhaps a corruption of the European name, which, according to Provancher, is also used in Quebec.)	Cerisier à grappe.
Crataegus.	Esnils. (In Quebec called Senellier.)	Épine. (Éspine)
Carum Carui.	Aneine. (In Quebec called *Anis* des Vosges. The name *anis*, in France, however, refers to *Pimpinella Anisum.*)	Carvi.
Aralia nudicaulis.	La Patoie. (Probably *Patte d'oie* in reference to the leaf-habit of the plant.)	
Viburnum Opulus.	Pabina. (In Quebec, Pimbina.)	Viorne.
Vaccinium.	Bluet. (In France this name is applied to *Centaurea Cyanus.*)	Airelle.

The following common plants have retained in Madawaska the names applied to them in France: *Populus tremuloides*, Tremble; *Alnus*, l'Aune; *Trifolium*, Trèfle; *Acer*, l'Érable; *Taraxacum officinale*, Pissenlit.

ON THE PLANTS INTRODUCED BY MINOT PRATT AT CONCORD, MASSACHUSETTS.

There have undoubtedly been many attempts to enrich floras of particular places by the artificial introduction of attractive plants from other regions. But most efforts of this kind have been sporadic, short-lived, and relatively futile. The nice adjustment which exists in every native vegetation as the result of long competition and jostling of its components can rarely be disturbed to advantage by human agency. If a new plant is introduced one of three not easily predicted results is sure to ensue. The species may find congenial conditions, withstand the competition of the native plants, and quickly increase so that it becomes in some instances a noxious weed, displacing portions of the indigenous vegetation. On the other hand it may, and usually does, fail to make headway against its acclimated neighbors, it thrives only while under artificial protection, and when left to shift for itself gradually decreases both in the number and vigor of the individuals until it

disappears altogether. The third case, although the one usually desired, is, alas, rarely attained, namely an adjustment of the flora by which the new element takes what may be styled a normal place in the vegetation, the planted individuals not only holding their own, but propagating themselves so that the species becomes diffused over a more or less considerable area without any such inordinate multiplication as would displace an appreciable part of the native flora.

The chance of obtaining this unusual result is so slight that such experiments are looked upon by botanists, in general, with suspicion if not disapproval. The matter is primarily one of horticulture rather than of botany, and to the botanist the problem of what can be made to grow in a given region is never of so much interest as the question what has, in the long struggle for existence, succeeded in growing there of itself.

However, the efforts of the late Minot Pratt to enrich the flora of Concord, were conducted with so much care, skill, and patience, extending over a long period of years and concerning a considerable variety of plants, that their results have a high degree of interest for the local botanist.

It was Mr. Pratt's custom to obtain several or, if possible, many thrifty individuals of a species not indigenous about Concord, but apparently suited to its climate. These he would set out at various points about Concord, in conditions of soil, moisture, and exposure which most nearly approximated those of their original occurrence. The species chosen were mostly those of the northern states from Vermont to Illinois, and were usually selected for their attractive flowers, such as Claytonia, Sabbatia, Dodecatheon, or for their interesting or economic qualities, such as Camptosorus, Aralia quinquefolia, etc. These efforts extended over many years from perhaps 1860 to 1875, and the plants were frequently visited and carefully tended while getting a start. For some twenty years, however, they have been practically left to themselves. Fortunately Mr. Pratt kept a record of most if not all of these introductions, the manuscript being in the Concord library.

The treatment of these species in local floras has naturally presented a somewhat awkward problem. It is known that many of them have occurred and some still persist in a practically "wild" state, so much so, in fact, that collectors who have come upon them, have sometimes insisted that they were "truly indigenous." Nearly all are

mentioned in Dame & Collins' Flora of Middlesex County, but with little data as to their relative abundance, and in some cases without much assurance that they were persisting at all.

With a hope of placing on record the actual although to some extent disappointing results of Mr. Pratt's work, and reducing the plants concerned to as definite a status as possible, we have applied for information to Mr. Alfred W. Hosmer, whose long and close familiarity with the flora of Concord permits him to speak with much authority upon these plants. Mr. Hosmer has most kindly sent the following lists, the first showing twenty-four species which have persisted through the last twenty or more years, and the second indicating those species which are said to have been introduced by Mr. Pratt, but now thought to be entirely extinct in the region. Considering Mr. Hosmer's well-known and intensive exploration of the Concord flora, we have no hesitation in recommending that plants of the latter list be hereafter omitted from local floras of the region, since they have had only a brief and horticultural relation to the vegetation of Concord.

Plants known to have been introduced by Minot Pratt and persisting in recent years:

Alfred W. Hosmer.

Hepatica acutiloba, DC., one station, spreading.

Xanthorrhiza apiifolia, L'Her., one station in the Esterbrook woods, spreading. Mr. Pratt's record says "Plant found on Monument street, 1870; propagated and set out on Mill brook."

Caulophyllum thalictroides, Michx., one station.

Dicentra Cucullaria, DC., one station, but spreading.

Viola rotundifolia, Michx., a few plants left.

Claytonia Virginica, L., spreading somewhat.

Oxalis Acetosella, L., spreading.

Acer spicatum, Lam., growing finely.

Potentilla tridentata, Ait., spreading somewhat.

Tiarella cordifolia, L., two stations, spreading.

Dodecatheon Meadia, L., one station.

Sabbatia chloroides, Pursh, one station, barely holding its own. Two stations have disappeared within five years.

Pogonatum giganteum, Dietrich, spreading.

Cypripedium pubescens, Willd., three plants only.

Iris cristata, Ait., a single station, at which last year the plant was nearly extinct, but this year again growing well.

Convallaria majalis, L., three stations, spreading.

Trillium nivale, Pursh, spreading.

Trillium grandiflorum, Salisb., only two or three plants left.

Abies balsamea, Marsh., three or four trees on Ponkawtasset.

Thuja occidentalis, L., like the preceding.

Asplenium angustifolium, Michx., one station.

Camptosorus rhizophyllus, Link, three stations.[1]

Aspidium Goldianum, Hook., spreading.

Cystopteris bulbifera, Bernh., two stations.

PLANTS SET OUT BY MR. PRATT WHICH HAVE NOT BEEN FOUND IN RECENT YEARS:

ALFRED W. HOSMER.

Ranunculus Pennsylvanicus, L. f.
Isopyrum biternatum, Torr & Gray.
Draba arabisans, Michx.
Viola rostrata, Muhl.
Viola striata, Ait.[2]
Viola Canadensis, L.
Viola cornuta, L.
Petalostemon violaceus, Michx.
Geum triflorum, Pursh.
Dalibarda repens, L.
Mitella diphylla, L.[3]
Ribes Cynosbati, L.
Aralia quinquefolia, Gray.
Sambucus racemosa, L.
Eupatorium ageratoides, L.
Liatris spicata, Willd.
Solidago squarrosa, Muhl.
Solidago tenuifolia, Pursh.
Boltonia asteroides, L'Her.
Silphium laciniatum, L.
Silphium terebinthinaceum, L.
Coreopsis trichosperma, Michx.
Helenium autumnale, L.
Onopordon acanthium, L.
Lobelia syphilitica, L.
Vaccinium Vitis-Idaea, L.
Periploca Graeca, L.
Hydrophyllum Virginicum, L.
Symphytum officinale, L.
Mertensia Virginica, DC.
Calamintha Clinopodium, Benth.
Lophanthus anisatus, Benth.
Dirca palustris, L.
Parietaria Pennsylvanica, Muhl.
Orchis spectabilis, L.
Habenaria obtusata, Richards.

1 *Podophyllum peltatum*, L., *Oxalis violacea*, L., *Monarda didyma*, L., and *Asarum Canadense*, L., are believed to have been established at Concord prior to Mr. Pratt's work, although he may have transplanted some individuals. All these species are thriving and spreading at their Concord stations.

2 Again set out by other persons within five years.

3 Not found since 1893.

Habenaria dilatata, Gray.
Cypripedium arietinum, R.Br.
Cypripedium spectabile, Sw.
Cypripedium parviflorum, Salisb.
Uvularia grandiflora, Smith.
Streptopus amplexifolius, DC.
Trillium sessile, L.

An easy method of propagating Drosera filiformis (Plate 8.) — While cultivating *Drosera filiformis*, Raf., for experimental work I learned, quite by accident, that the quickest way to obtain new plants is by making cuttings. I grow all my Drosera species in a greenhouse where the temperature is kept low. At some time or other parts of the leaves of *Drosera filiformis* were broken off and allowed to lie on the sand where they fell. In the course of a few weeks these parts were observed to be giving off young plants at close intervals. This method of obtaining new plants may prove valuable to botanists who are far removed from the habitat of *Drosera filiformis*, and wish to keep a large supply of the species in a living state for experimental purposes. *Drosera intermedia* var. *Americana*, *D. rotundifolia*, and *D. binata* will also give off new plants if leaves are placed on sand or moss. *D. rotundifolia* has been reported (Bull. Torr. Club, 1892, p. 295) with young plants growing out of its leaves, and I have seen specimens of a similar kind collected in late July. It would seem that this species, at least, has a tendency to propagate itself naturally by other means than seed. Whether *D. filiformis* and *D. binata* do the same in a wild state I am unable to say, although it seems highly probable. — Oakes Ames, North Easton, Mass.

Explanation of Plate 8. — *Drosera intermedia*, var. *Americana:* figs. A and B, young plants growing from the leaves; fig. F, longitudinal section of one of the young plants at point of origin. *D. filiformis:* figs. C and D, portions of leaves with young plants springing from them; fig. G, longitudinal section of a small plant and cross section of leaf from which it springs. *D. binata:* fig. E, part of leaf showing young plants. All figures enlarged.

Vaccinium uliginosum at a low altitude. — Some time ago I came across a large patch of *Vaccinium uliginosum*, growing at an altitude of three or four hundred feet in the town of Farmington, Maine. This species, generally found in the eastern states only on the alpine summits of New England and New York, seemed as much at home at this lowland station as if it had been at a much higher altitude. The leaves

were very fragrant and the pink and white flowers very beautiful. — HERBERT W. JEWELL, West Farmington, Maine.

[In August, 1896, J. Franklin Collins, W. C. Strong and M. L. Fernald saw this mountain bilberry in abundance on the ledgy shores of Carrabassett river in Jerusalem, Maine, whence it was perhaps brought from the upper slopes of Mt. Bigelow or Mt. Abraham. Miss Kate Furbish has collected the same species at Fort Kent on the St. John river. — ED.]

A VIOLET-FLOWERED FORM OF THE FRINGED POLYGALA. — In 1893, I found by the side of an old wood road in Sudbury, Massachusetts, an unusual form of *Polygala paucifolia*, Willd., covering a space some fifteen feet long by two feet broad. Its flowers were a deep violet and the leaves more rounded than in the common typical form. The violet-flowered plants have now spread some hundred feet along the road and perhaps ten feet into the woods on each side of it. The typical form with rose-purple flowers, grows with the violet-flowered, just as here at Concord it is associated with a gradually increasing white-flowered form. — ALFRED W. HOSMER, Concord, Mass.

PUBESCENT CAPSULES OF OENOTHERA PUMILA. — During a visit to southern Maine I found the common plant, which I had always called *Oenothera pumila*, passing as *Oe. fruticosa*. The local botanists, following the current descriptions, said "This cannot be *Oe. pumila*, for it has pubescent pods." Upon examination of herbarium material it appears that the Maine specimens are in no way unique. Many plants from various regions have the capsules finely puberulous, and the wings bear, especially along the edges, more or less abundant elongated glandular hairs. Similar hairs are also found on the stem. Other plants have the capsules quite glabrous or with only a few scattered hairs, so that it is probable that the plants with pubescent capsules cannot be separated from the more glabrate form. Reference to recent manuals and monographs of the group shows that the capsule has of late been uniformly described as glabrous. In the key to this species (as *Kneiffia pumila*, Spach), however, in the Illustrated Flora, Dr. Small says "pedicels and capsules glabrous or glabrate," but in the specific description the latter word is omitted and the accompanying figure shows what is apparently a glabrous capsule. Linnæus, in his original descrip-

tion, did not speak of the pubescence, and Miller's plate[1] which he cites represents glabrous capsules.

On the other hand, some of the earlier botanists noted this tendency of the capsules to be pubescent. In 1796, in his Botanical Magazine (t. 355) Curtis represented the plant with capsules pubescent as in the southern Maine specimens. In his Monographia Onagrearum, Spach describes the capsules of the plant (his *Kneiffia pumila*) as puberulent, and Torrey and Gray speak of them as minutely puberulent. — M. L. Fernald.

THE LOCAL FLORAS OF NEW ENGLAND.

Mary A. Day.

(Continued from page 158.)

Massachusetts.

Bristol County: —

144. **Hervey, Eliphalet Williams.** Catalogue of the plants found in New Bedford and its vicinity; arranged according to the season of their flowering. New Bedford, 1860, pp. 30. Annot. catalog. *phaenog.* and *cryptog.*

145. —— Flora of New Bedford and the shores of Buzzard's Bay, with a procession of the flowers. New Bedford, 1891, pp. 80. Annot. catalog. *phaenog.* and *cryptog.*

146. **Willey, Henry.** Enumeration of the lichens found in New Bedford, Mass., and its vicinity, from 1862 to 1892. Printed for the author at New Bedford, 1892. *cryptog.* Not seen.

Dukes County: —

147. **Hollick, Arthur.** Observations on the geology and botany of Martha's Vineyard. Trans. N. Y. Acad. Sci. xiii. 1893, pp. 8–21. List. *phaenog.* and *vasc. cryptog.* N. H.

148. **Jordan, David Starr.** The flora of Penikese Island. Am. Nat. viii. 1874, pp. 193–197. List. *phaenog.* and *cryptog.*

149. **Morong, Thomas.** The flora of Martha's Vineyard and vicinity. Field and Forest, iii. 1877, pp. 119–124. Select. spec., popular treatm. *phaenog.*

Essex County: —

150. **Alcott, William Penn.** Introduced plants found in the vicinity of a wool-scouring establishment. Bull. Essex Inst. xii. 1881, pp. 162–166. Annot. catalog. *phaenog.* H. C.

[1] Mill. Dict. t. 188.

151. **Buttrick, Samuel Bartlett.** Calendar of spring for 1855 and 1856. Proc. Essex Inst. ii. 1857, pp. 172–173 List. *phaenog.* H. C.

152. —— [List of plants found in Salem, and within seven or eight miles of Salem, 1857.] Proc. Essex Inst. ii. 1857, pp. 233–242. Annot. catalog. *phaenog.* H. C.

153. **Horner, Charlotte Nichols Saunders.** Flora of Georgetown. Georgetown Advocate, ii. February 26, March 18, April 1, 1876. Annot. catalog. *phaenog.* E. I.

154. —— Notes on the flora of South Georgetown. Bull. Essex Inst. xv. 1885, pp. 107–110. List. *phaenog.* and *vasc. cryptog.* H. C.

155. **Leonard, Henry Codman.** Trees and flowers of Cape Ann. In his Pigeon Cove and vicinity. 1873, pp. 140–156. List. *phaenog.* and *vasc. cryptog.* H. C.

156. **Markoe, George Frederick Holmes.** Catalogue of plants [of Gloucester]. Proc. Essex Inst. iii. 1862, pp. 24–27. Annot. catalog. *phaenog.* and *vasc. cryptog.* H. C.

157. **M[oulton, Edward.]** Flora of this vicinity [Newburyport]. 32 pts. Newburyport Daily Standard, March to November, 1891. Annot. catalog. *phaenog.*

158. **Osgood, George.** List of plants collected from March 25 to November 27, 1853, principally from North Danvers, with a few from Pleasant Pond, Wenham. Salem Gazette, May 26, June 2, 1854. Annot. catalog. *phaenog.* E. I.

159. **Paine, Harriet Eliza.** Groveland plants not reported by Mr. Robinson in his County flora. Bull. Essex Inst. xv. 1883, pp. 134. Suppl. list. *phaenog.* H. C.

160. —— Plants shown at the meeting in Groveland, Mass., August, 1883. Bull. Essex Inst. xv. 1883, p. 133. Suppl. list. *phaenog.* H. C.

161. **Perley, Mary Ellen.** Flora of Boxford. Georgetown Advocate, ii. March 11, 25, 1876. List. *phaenog.* and *vasc. cryptog.* E. I.

162. **Robinson, John.** Ferns of Essex County, Mass. Bull. Essex Inst. vii. 1875, pp. 44–54. Addenda. vii. pp. 147–148. Additions to the ferns of Essex County, ix. 1877, p. 98. Annot. catalog. *cryptog.* H. C.

163. —— The flora of Essex County, Massachusetts. Salem, 1880, pp. 200. Annot. catalog. *phaenog.* and *cryptog.*

Sketches of some early botanists, pp. 17–26.

164. **Robinson, John.** THE NATIVE WOODS OF ESSEX COUNTY, MASSACHUSETTS. AN ACCOUNT OF THE GENERAL DISTRIBUTIONS AND USES, THE DETERMINATIONS OF SPECIFIC GRAVITY, PERCENTAGE ASH, STRENGTH, FUEL VALUE, ETC., OF THE WOODS OF THE NATIVE TREES OF ESSEX COUNTY, AS SHOWN BY TESTS UPON SPECIMENS FURNISHED BY THE PEABODY ACADEMY OF SCIENCE. Rep. Peabody Acad. Sci. 1884, pp. 103–137. Reprint, 1885. Annot. catalog. *phaenog.*

165. —— NOTES ON THE NATIVE AND EXTENSIVELY INTRODUCED WOODY PLANTS OF ESSEX COUNTY, MASSACHUSETTS. Bull. Essex Inst. xi. 1879, pp. 72–106. Reprint, 1879, pp. 38. Annot. catalog. *phaenog.*

166. **Russell, John Lewis.** NOTICE OF RARE PLANTS WITH A DESCRIPTION OF A CURIOUS VARIETY OF CLADONIA UNCIALIS. Jour. Essex Co. Nat. Hist. Soc. 1852, pp. 96–100. Select. spec., popular treatm. *phaenog.* H. C.

167. —— NOTICE OF SOME PLANTS OF LYNNFIELD, DANVERS, MANCHESTER, ETC., ESSEX COUNTY, MASSACHUSETTS. Hovey's Mag. xvi. 1850, pp. 97–107. Select. spec., popular treatm. *phaenog.* and *cryptog.*

168. —— SOME PLANTS OF DANVERS AND WENHAM, ESSEX COUNTY, MASSACHUSETTS. Hovey's Mag. xv. 1849, pp. 289–296. Selec. spec., popular treatm. *phaenog.*

169. **Sears, John Henry.** LIST OF NATIVE AND INTRODUCED PLANTS OBSERVED IN FLOWER IN THE VICINITY OF SALEM, DURING THE SPRING OF 1886, ON OR BEFORE MAY 1. Bull. Essex Inst. xviii. 1886, pp. 95–98. List. *phaenog.* H. C.

170. —— WEEDS OF ESSEX COUNTY. Bull. Essex Inst. xv. 1893, pp. 93–104. Annot. catalog. *phaenog.* and *cryptog.* H. C.

171. **Sprague, Charles James.** LICHENS OF ESSEX COUNTY, MASSACHUSETTS. Reprint from Robinson, J. Flora, of Essex County, pp. 149–153. List. *cryptog.*

172. **Tracy, Cyrus Mason.** NOTICEABLE TRAITS OF THE FLORA OF NAHANT. Proc. Essex Inst. ii. 1858, pp. 272–277. Select. spec., popular treatm. *phaenog.* H. C.

173. —— STUDIES OF THE ESSEX FLORA; A COMPLETE ENUMERATION OF ALL PLANTS FOUND GROWING NATURALLY WITHIN THE LIMITS OF LYNN AND THE TOWNS ADJOINING. Lynn, 1858, pp. 87. Annot. catalog. *phaenog.*

—— Same. Lynn, 1892, pp. 99. Annot. catalog. *phaenog.*

Franklin County: —

174. **Williams, Stephen Wells.** CATALOGUE OF SOME MEDICINAL PLANTS FOUND GROWING IN THE COUNTY OF FRANKLIN. With his history of Franklin County (read 1842) in Med. Comm. Mass. Med. Soc. vii. 1848, pp. 50–54. List. *phaenog.* B. A.

175. —— FLORAL CALENDAR KEPT AT DEERFIELD, MASSACHUSETTS, WITH MISCELLANEOUS REMARKS. Am. Jour. Sci. i. 1819, pp. 359–373. Select. spec., popular treatm. *phaenog.*

Hampshire County: —

176. **Hitchcock, Edward.** CATALOGUE OF PLANTS GROWING WITHOUT CULTIVATION IN THE VICINITY OF AMHERST COLLEGE. Amherst 1829, pp. 64. Annot. catalog. *phaenog.* and *cryptog.* M. H.

177. **Humphrey, James Ellis.** AMHERST TREES. AN AID TO THEIR STUDY. Amherst, 1892, pp. 78. Select. spec., popular treatm. *phaenog.*

Based upon a series of eleven papers, bearing the same title, which originally appeared in the Amherst Record, from May 4 to July 13, 1892, with additions.

178. **Jesup, Henry Griswold.** THE WILLOWS OF AMHERST, MASSACHUSETTS. Bull. Torr. Club, iii. 1872, pp. 41–42. Select. spec., technic. treatm. *phaenog.*

179. **Porter, Jacob.** FLORAL AND MISCELLANEOUS CALENDAR FOR PLAINFIELD, MASSACHUSETTS, 100 MILES WEST OF BOSTON (LAT. SUPPOSED ABOUT 42°, 30′ AND LON. WEST FROM LONDON 73° — MORE THAN 100 MILES FROM THE OCEAN — COUNTRY, HILLY AND ELEVATED). Am. Jour. Sci. iii. 1821, pp. 273–284. Select. spec., popular treatm. *phaenog.*

180. —— FLORAL CALENDAR FOR PLAINFIELD, MASSACHUSETTS. 1818. Am. Jour. Sci. i. 1819, pp. 254–255. Select. spec., popular treatm. *phaenog.*

Middlesex County: —

181. A LIST OF PLANTS GROWING WITHOUT CULTIVATION IN MALDEN AND MEDFORD, MASSACHUSETTS, WITH SOME CONTRIBUTIONS TO A FLORA OF MIDDLESEX COUNTY. Malden, 1881, pp. 19. Annot. catalog. *phaenog.* and *cryptog.*

Published by Middlesex Institute. Hattie Sylvester, custodian.

182. A PARTIAL LIST OF THE NATIVE FLORA OF WALTHAM, MASSACHUSETTS. Waltham, 1883, pp. 36. List. *phaenog.* and *cryptog.*

Published by the Botany Club of Waltham.

183. [**Chase, Charles Chauncy.**] FLORA OF LOWELL AND VICINITY. Lowell Morning Mail, November 21, 1882. List. *phaenog.* and *vasc. cryptog.*

184. **Dame, Lorin Lowe & Collins, Frank Shipley.** Flora of Middlesex County, Massachusetts. Malden, 1888, pp. 201. Map. Annot. Catalog. *phaenog.* and *cryptog.*

185. **Davenport, George Edward.** Flora of Medford [with a full account of the ferns of Massachusetts. Being a series of papers published in the Medford Chronicle, 1875–1876]. Medford Chronicle, 1875–1876. Select. spec., popular treatm. *phaenog.* and *vasc. cryptog.* M. H.

186. **Russell, John Lewis.** Notice of some plants in this vicinity [Chelmsford]. Hovey's Mag. vii. 1841, pp. 130–131. Select. spec., popular treatm. *phaenog.*

Nantucket County:—

187. **Owen, Maria Louisa.** A catalogue of plants growing without cultivation in the County of Nantucket, Massachusetts. Northampton, 1888, pp. 87. Annot. catalog. *phaenog.* and *cryptog.*

188. —— Catalogue of plants growing without cultivation on the Island of Nantucket. In Godfrey, E. K. The Island of Nantucket, what it was and what it is. 1882, pp. 39–47. List. *phaenog.* and *cryptog.* H. C.

Norfolk County:—

189. **Churchill, Joseph Richmond.** List of trees and plants growing naturally in Milton, Massachusetts. In History of Milton, published by a committee of the Town. 1887, pp. 600–613. Reprint, pp. 16. Annot. catalog. *phaenog.* and *vasc. cryptog.*

190. **Collier, Priscilla Lothrop.** Botany of Cohasset. In Bigelow, E. V. A narrative history of the Town of Cohasset, Massachusetts. 1898, pp. 541–542. Annot. catalog. *phaenog.* and *cryptog.* H. C.

191. **Stodder, Charles.** On a recent gathering of diatomaceous mud from Pleasant Beach, Cohasset. Proc. Bost. Soc. Nat. Hist. xi. 1867, pp. 131–134. Select. spec., technic. treatm. *cryptog.* N. H.

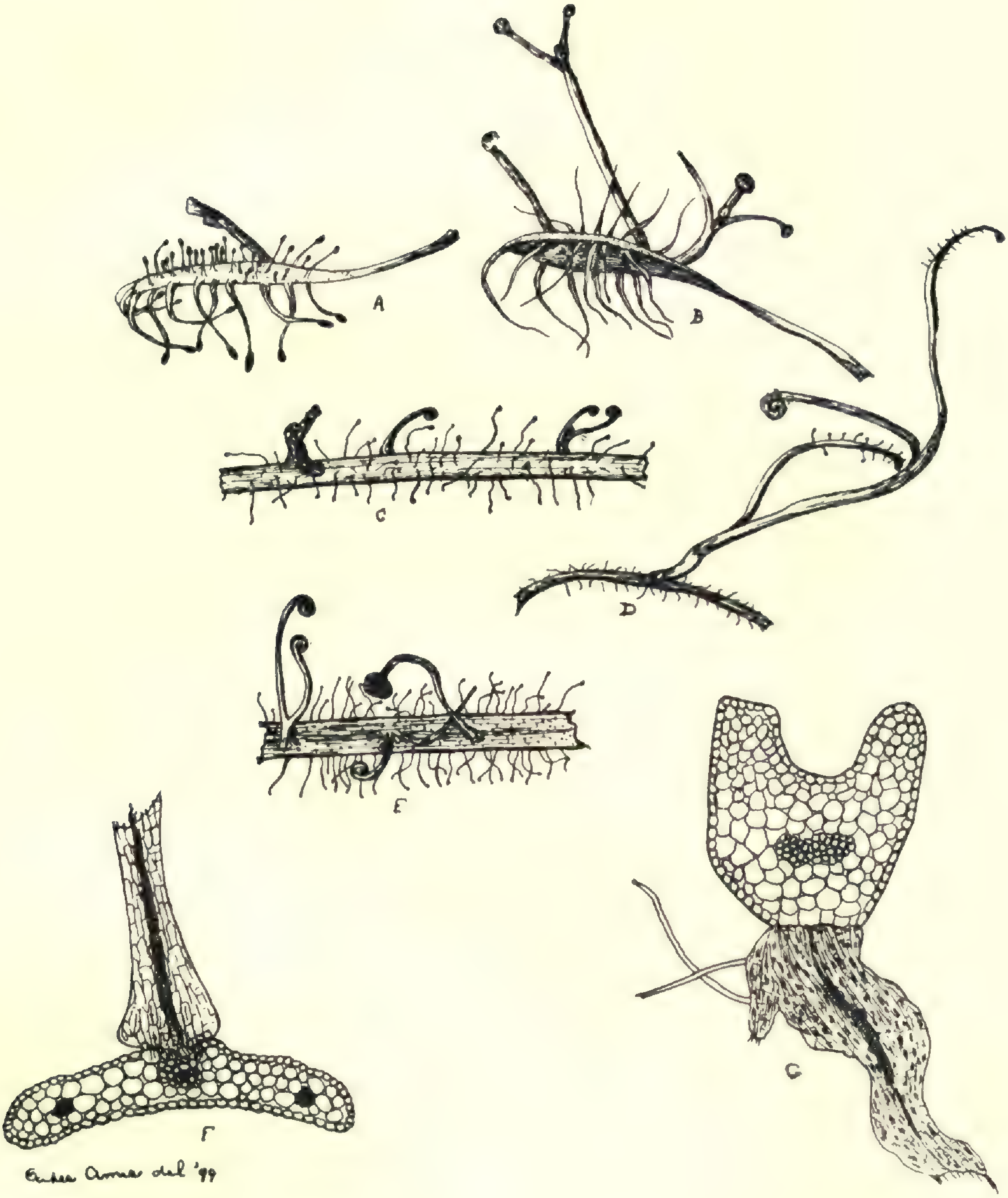
Plymouth County:—

192. **Lewis, James S.** Forest trees and shrubs of Hingham. Abstract of returns of the Agricultural Societies of Massachusetts. 1867, pp. 109–115. Bound with 15th Rep. Sec. Mass. Board Agric., 1867. Annot. catalog. *phaenog.*

193. **Russell, John Lewis.** Notice of some rare and beautiful plants growing in the vicinity of Plymouth, Massachusetts. Hovey's Mag. iii. 1837, pp. 441–443. Select. spec., popular treatm. *phaenog.*

(To be continued.)

Vol. 1, No. 8, including pages 143 to 160 and plate 7, was issued August 1, 1899.



Propagation of Drosera.

Rhodora

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SOME RARE PLANTS OF NEEDHAM, MASSACHUSETTS.

T. O. Fuller.

Like that of most towns in the vicinity of large cities, the flora of Needham is undergoing slow but continual changes, by the introduction of species foreign to its soil, and the extinction of some endemic ones which are so unfortunate as to grow only in the path of settlement. However desirable the increase of population may be in the view of the political economist, some of its accompaniments cause serious mischief for the lover of wild plants. He cannot see great roadside trees in their second century, giants which can never be replaced, cut down by order of their temporary owner because a small area of his field is shaded, without a feeling of indignation; and the extermination of a species from his township by the irresistible wave of improvement leaves a sense of keenest regret.

No doubt many species disappear whose loss is unnoticed; but a few instances have come under my observation. In the course of years some may perish from entirely natural causes. Such may have been the case with *Hottonia inflata*, which grew here sixty years ago, authenticated by specimens in my possession, collected by our first botanist, Dr. Josiah Noyes, in 1834. This species may have been torn up by ice in spring and carried away by floods. Dr. Noyes also found *Polygonella articulata* at two stations, and *Crotalaria sagittalis*, but neither grows here now.

Castilleia coccinea is of more recent extinction, and clearly by the hand of man. It flourished abundantly in one meadow thirty years ago, until a street was laid out directly through its home, and the traveling public, coming within view of the remaining plants, soon extirpated this beautiful native from our flora. Twenty years since *Aletris farinosa* was in our list, but the ground is now occupied by houses.

Lespedeza procumbens has been growing for seventy years in a narrow strip by the side of a constantly traveled road, where the wheels of carriages occasionally pass over the more aspiring stems. The widening of this road would surely destroy our only station.

The following rare species now growing in Needham, or in its immediate neighborhood, are confined to extremely limited areas, and are therefore exposed to extermination by what has been termed, not inaptly from our point of view, "the shabby tide of progress"; and it may be of interest to have a record of their present status.

Staphylea trifolia, L. In the second edition of Bigelow's Florula Bostoniensis, this is given as growing "In woods at Weston." The Middlesex County Flora, sixty-four years later, refers to Bigelow's statement, and says it has not since been reported in the county. It is not included in the Flora of Essex County, nor in Jackson's Worcester County List. I found it in Needham in 1883, growing among rocks, in low land in the woods, the tallest shrubs reaching a height of ten feet and a trunk diameter of one inch. It formed a small colony, remote from any house or public road, and could hardly have been planted by design in that retired forest. It usually flowers the first week in June, although in 1889 it was in full flower May 19. It is quite conspicuous while in bloom, but the flowers are early deciduous, falling off entire at the joint of the pedicel, for which reason it rarely matures fruit here.

Conioselinum Canadense, T. & G. This seems to be an extremely rare species in eastern Massachusetts. The only plants I have seen other than from Needham, were exhibited by the Massachusetts Horticultural Society in 1895, collected in Holbrook, Mass. William Oakes, in Hovey's Magazine of Horticulture, mentions finding "this long-overlooked species" in "Mast Swamp, Plymouth, Mass.," in 1839. I first met with it in Needham in 1883, near the source of Rosemary brook. It grows in very deep, black soil, which is constantly saturated with water, and shaded by large trees. It flowers from July 20 to the middle of August, and fruits abundantly. The leaves much resemble the fronds of *Botrychium Virginianum*. This is in danger of extermination, as the low land near it has been recently drained, preparatory to being offered for house-lots.

Lonicera caerulea, L. A space of ten feet in diameter in a large open meadow is covered with this species, profusely in flower the first two weeks in May. It is cut down every year when the grass is mowed, yet continues to flourish in spite of this discouragement.

Solidago tenuifolia, Pursh, grows in two places, both of narrow limits, a mile apart; one at the margin of a wet meadow; the other in a dry upland field.

Andromeda polifolia, L. Sparingly among low bushes in one meadow.

Liparis Loeselii, Richard. Collected at two stations in Needham, but has not been seen for several years.

Habenaria ciliaris, R. Br. The Dedham station for this rare species is inseparably associated with the late Mr. E. H. Hitchings. I well remember the animated story of his two hundred mile search, season after season, guided by the slenderest clew, before this ardent lover of our wild plants found the Yellow Orchis. His eighty years were but as twenty, and the most indifferent follower of Nature could not but share his pleasure. It grows there in dry soil, among Pitch Pines and Osmunda and Pteris. Some years only two or three plants flower, and seldom twenty. It is in perfection of bloom the last week in July and the first in August.

Smilacina trifolia, L. Abundant in a small, permanently wet bog, north of Great Plain Avenue, Needham, covering a space of twenty feet diameter, growing in sphagnum, shaded by Alders and Poison Sumach. It does not flower very freely, and I have never been able to find fruit. In flower May 10 to June 5.

Trisetum palustre, Torr. I have found this grass in two meadows in Needham, growing rather plentifully over considerable areas.

T. subspicatum, Beauv. var. *molle*, Gray. This unexpected variety I found in High Rock woods several seasons; a few plants scattered along for a hundred feet on a high, shaded ledge.

Eatonia Pennsylvanica, Gray. In one meadow.

E. Dudleyi, Vasey. In more than one piece of dry upland woods.

Camptosorus rhizophyllus, Link. In Eaton's Ferns of North America this is said to have "lately been found a few miles from Boston; but there is a doubt whether the station is truly natural." It was found in Needham in 1877, by Mr. Storrow Higginson, by whom the plants were shown to Mr. William Edwards of Natick. Mr. Edwards announced the discovery in the Bulletin of the Torrey Botanical Club, January, 1878, adding, "As it has never before been reported this side of Mt. Tom in the western part of the state, its presence here will be received with rejoicing by the many lovers of ferns in this quarter." In the same journal for the following month Mr. Davenport discussed its

origin here, and concludes that it is not indigenous, but must have been set out by some botanist. As, however, it still persists after twenty-two years left entirely to Nature's care, and manifests no tendency to decrease in either numbers or vigor, I incline to the opinion of Mr. Higginson, that it originated here through natural agencies, probably from wind-sown spores, long antecedent to its discovery. The plants grow in the crevices on one rock, which is only six feet through at the base, and five feet high. The fronds do not possess the luxuriant growth exhibited in its natural habitat, the largest fronds being nine to ten inches long, and five-eighths inch wide at base, with little disposition to produce auricles, or to root at the tips.

Lygodium palmatum, Swartz. This rare fern grows in Dover, adjoining Needham, where I have collected beautiful, fully fruited specimens. It occupies a small space in a shrubby pasture, the fronds climbing principally on *Spiraea salicifolia.*

FLORA OF THE POCONO PLATEAU.

THOMAS C. PORTER.

Rhodora is certainly a well-chosen name for the journal of the New England Botanical Club, both because of its euphony and because borrowed from a genus of plants represented by a solitary species, and that a hardy shrub which produces unique and beautiful flowers. And yet, this shrub, immortalized by Emerson in verse, is not, as some might suppose, confined to New England, for it exists elsewhere, in Canada and northern New York, and has, besides, a range much farther south. On the Pocono Plateau, embracing the western half of Monroe County, Pennsylvania, and portions of the adjioning counties, it flourishes in many places and when in full bloom, early in June, along with the *Azalea canescens* of Michaux, fills the swamps and open woods with a glorious display. The latter sometimes attains the height of ten feet and is readily distinguished from the allied *A. nudiflora* by its hoary leaves and the single set of short gland-tipped hairs on the tube of the corolla.

The Pocono region, as well as the mountains to the north, south and west of it, has an elevation of from 2000 to 2300 feet above the sea, and hence its mean annual temperature is nearly that of the Adirondacks and Mount Desert Island. Lying, too, within the great bowlder-line, it has been the theatre of immense glacial action, the results of

which are evident in vast accumulations of drift and numerous ponds, lakes and sphagnum-bogs. Its flora, therefore, is largely northern in its character and the conditions being very favorable to the growth of the shrubby *Ericaceae*, other companions of the *Rhodora* appear, such as *Ledum Groenlandicum* (*L. latifolium*, Ait.), *Kalmia glauca*, *Andromeda polifolia*, *Cassandra calyculata*, *Chiogenes hispidula* (*C. serpyllifolia*, Salisb.), *Vaccinium Canadense* and *Vaccinium Oxycoccus*. Amongst the trees and other shrubs, *Picea Mariana* (*P. nigra*, Link), *Abies balsamea*, *Larix laricina* (*L. Americana*, Michx.), *Myrica Gale*, *Betula populifolia*, *Pyrus Americana*, *Nemopanthes Canadensis* (*Nemopanthus fascicularis*, Raf.) and *Viburnum lantanoides* abound, whilst *Pinus resinosa*, *Betula papyrifera* and *Lonicera caerulea* are scarce and local.

The following list of seventy additional species, most of which, as far as known, do not occur further south, will best exhibit the northern character of the flora. It might be increased and, if the whole territory in the State, above the bowlder line, were included, the number could be more than doubled: —

Botrychium simplex
B. lanceolatum
B. matricaria
Dryopteris Braunii
(*Aspidium aculeatum*, Swartz, var. *Braunii*, Koch)
D. simulata
(*Aspidium simulatum*, Davenport)
Potamogeton Oakesiana
Scheuchzeria palustris
Panicum xanthophysum
Oryzopsis juncea
(*O. Canadensis*, Torr.)
Milium effusum
Cinna latifolia (*C. pendula*, Trin.)
Avena striata
Poa debilis
Panicularia laxa
(*Glyceria laxa*, Scribner)
Agropyron caninum
Eriophorum vaginatum
Carex pauciflora
C. oligosperma
C. retrorsa
C. Schweinitzii
C. Goodenovii
(*C. rigida*, Good., var. *Goodenovii*, Bailey)
C. limosa
C. Magellanica
C. longirostris
C. arctata
C. deflexa
C. pallescens
C. chordorhiza
C. tenella
C. Deweyana
Calla palustris
Xyris montana
(*X. flexuosa*, Muhl., var. *pusilla*, Gray)

Juncus filiformis
Vagnera trifolia
(*Smilacina trifolia*, Desf.)
Streptopus roseus
S. amplexifolius
Trillium undulatum
(*T. erythrocarpum*, Michx.)
Clintonia borealis
Habenaria hyperborea
Listera cordata
Microstylis monophyllos
Razoumofskya pusilla
(*Arceuthobium pusillum*, Peck)
Polygonum cilinode
Stellaria borealis
Arenaria Groenlandica
Nymphaea Kalmiana
(*Nuphar minimum*, Smith)
N. rubrodisca
(*Nuphar advena*, Ait. f., var. *minus*, Morong)
Trollius laxus
Mitella nuda
Ribes lacustre
R. prostratum
Potentilla tridentata
P. argentea
P. palustris
Rubus strigosus
R. triflorus
R. neglectus
Dalibarda repens
Amelanchier oligocarpa
Oxalis Acetosella
Viola Selkirkii
Hypericum boreale
Naumburgia thyrsiflora
(*Lysimachia thyrsiflora*, L.)
Gentiana linearis
Menyanthes trifoliata
Linnaea borealis
Lobelia Dortmanna
Aster acuminatus
A. Radula
Hieracium Canadense

A remarkable feature of the flora, worthy of note, is the occurrence, with these northern and mountain species, of so many plants that have their chief home on the lowlands of the coast. Of these a brief list is given: —

Woodwardia Virginica
Lygodium palmatum
Lycopodium inundatum
Eleocharis olivacea
Scirpus Torreyi
S. subterminalis
Carex Collinsii
(*C. subulata*, Michx.)
C. albolutescens
Orontium aquaticum
Eriocaulon septangulare
Peltandra Virginica
(*P. undulata*, Raf.)
Pontederia cordata
Juncus pelocarpus
Juncus militaris
Aletris farinosa
Amianthium muscaetoxicum
Habenaria blephariglottis
Polygonum Careyi
Myriophyllum tenellum
Rhexia Virginica
Proserpinaca palustris
Limnanthemum lacunosum
Utricularia purpurea
Utricularia cornuta

But the same thing has been observed also at much higher altitudes in the southern states, and it surprises the botanist to find on the summits of Table Rock and Roan Mountain in North Carolina the *Zygadenos leimanthoides*, *Xerophyllum asphodeloides* and *Leiophyllum buxifolium* which he had collected on the sandy flats of New Jersey.

NOTES ON MAINE PLANTS.

ELMER D. MERRILL.

THE following notes on Maine plants may be of interest to students of the flora of that state. Several of the plants enumerated below have never before been listed from the state, and others reëstablish localities for species which have been previously reported, but for which the locality has been lost.

The few species listed from Mt. Ktaadn are added more especially because of the interest of the locality. During a trip there in September, 1898, about fifty of the typical alpine and subalpine forms of that region were collected, which have previously been reported by Scribner, Bot. Gaz. **14**: 46, Briggs, Bull. Torr. Bot. Club, **19**: 334, and other collectors.

The grasses of the following list were named by Professor Scribner.

Isoetes echinospora Braunii (Durieu) Engelm. Abundant in shallow water and partly emersed. Three Ponds, Mt. Ktaadn, September, 1898. Altitude about 2,000 feet.

Oryzopsis melanocarpa Muhl. Growing abundantly on rocky wooded hillsides. East Auburn, August, 1898. Not previously reported from the state.

Panicum macrocarpon LeConte. East Auburn, June, 1896, and July, 1898. Reported as *P. macrocarpon* Torr, by F. L. Harvey in Bull. Torr. Bot. Club, **25**: 211.

Panicum tsugetorum Nash. Pastures, East Auburn, July, 1898. A form referred to this species by Professor Scribner. *P. implicatum* Scribn. and *P. boreale* Nash were again collected at this locality in July, 1898.

Polygonum Zuccarinii Small (*P. cuspidatum*, Sieb. & Zucc.). Waste places, Basin Mills, Orono. Escaped from cultivation, and very persistent.

Alsine borealis (Bigel.) Britton (*Stellaria borealis* Bigel.). Near a

rivulet on the slope of South Basin, Mt. Ktaadn, September, 1898. Altitude about 4,500 feet.

Cardamine bellidifolia L. Abundant on sandy shores of South Basin Pond, Mt. Ktaadn, September, 1898. Altitude about 2,500 feet.

Podostemon ceratophyllum Michx. On rocks in swift water, Chemo Stream, Bradley, November, 1898. This plant was excluded from the Maine Flora, by Mr. Fernald, as no locality was known.

Vaccinium caespitosum Michx. Slope of South Basin, Mt. Ktaadn, September, 1898.

Cynoglossum Virginicum L. Border of woods, Orono, June, 1898. This plant is reported in the Portland Catalogue as questionable.

Senecio Balsamitae Muhl. (*S. aureus* var. *Balsamitae* Torr. & Gray). Border of Three Ponds, Mt. Ktaadn. Altitude about 2,000 feet. A few specimens in bloom in September, 1898.

University of Maine, Orono.

ON THE EDIBILITY OF CLITOCYBE ILLUDENS.

Mr. Frank J. Wills, of Winchester, Mass., writes to the Boston Mycological Club as follows : —

"I have had an experience with *Clitocybe illudens* which, it strikes me, should have some official record. You will find it classed among the non-edible varieties,[1] but last year my family found it very good eating. I tried a few specimens myself, and the next day cooked the remainder of the clump, which gave us enough to fill the chafing-dish. I parboiled them first in salted water, and rinsed them well, then stewed them with cream, butter and seasoning.

"Saturday last I brought a clump to the exhibition, where they were identified, so that there could be no possible mistake in the matter. I also sent a specimen to Mr. Peck, who declared it to be rightly named, and wrote me the following note, which may be valuable for reference ;

Dear Sir, — The specimen you send reached me this morning. It is certainly *Clitocybe illudens* Schw., as the members of the Mycological Club say.

Boiling it a few minutes in salt water probably saved you from an attack of nausea and vomiting. Two or three of my correspondents have been led by its attractive appearance to try it incautiously, but with unpleasant results, which prove to my satisfaction that it should not be classed among the wholesome species.

1 See Rhodora 1: 43.

Even harmful species may be treated with salt water and vinegar so that they may be made harmless, but this does not, to my mind, render them worthy of being classed with those that are edible without such treatment.

Very truly yours,

CHAS. H. PECK.

"We have now before us the question as to what constitutes edibility in a mushroom. As a natural food product, the mushroom must take its place with other vegetable growths, and it occurs to me that, if the subject were investigated, it would be found that many familiar foods are rendered nutritious by certain processes of cooking, without which they would be harmful."

[The question of the edibility of certain noxious fungi has been raised before, for instance in regard to acrid species of Lactarius and Russula. Although experience has shown that proper treatment robs them of their power to do harm, and thus renders their substance a convenient vehicle for savory seasoning, prudence will always require, as Mr. Peck asserts in his letter to Mr. Wills, that such species, when there is no room for full notes upon them, be left in the non-edible list, and stigmatized as noxious. — ED.]

SOME UNDESCRIBED AND LITTLE-KNOWN VARIETIES OF ASTER AND SOLIDAGO.

M. L. FERNALD.

IN the study of the northeastern asters and goldenrods my attention has been called from time to time to some strongly marked varieties of well-known species which so maintain their characteristics that they seem worthy of varietal names. Careful study in the field leads me to consider all the forms here described extreme variations from more common specific types rather than distinct species. The forms of *Aster multiflorus*, *A. vimineus*, *A. puniceus* and *A. tardiflorus*, though habitally unique in their extremes, pass very clearly into the typical forms of those species. The last plant is one of several remarkably pubescent forms, as *A. longifolius*, Lam., var. *villicaulis*, Gray and *A. cordifolius*, L., var. *Furbishiae*, Fernald (Proc. Port. Soc. Nat. Hist. ii. 129), which occur on the banks of the St. John and other rivers of northern New England. The *Solidago*, though remarkably large, presents no apparent floral characters to separate it from the exceedingly variable *S. Virgaurea*.

Aster multiflorus, Ait., var. **exiguus**. A slender plant differing from the species in its flexuous branches terminated by solitary or rarely slightly clustered heads. — *A. ciliatus*, Muhl. in Willd. Sp. iii.

2027, not Walter, Car. 209. — Described by Muhlenberg from "North America." Collected by *W. W. Eggleston* at Norwich, Vermont, September, 1889; also in eastern Massachusetts, at Prides Crossing (*Miss Anna L. Jackson*), Lexington (*Miss E. L. Shaw*), and at Dedham (*C. E. Faxon*). These specimens agree very well with a sheet of Muhlenberg's species sent to the Gray Herbarium by Nees von Esenbeck. The var. *exiguus* might readily be mistaken for a small-headed *A. dumosus*, but it is quickly distinguished by its hispidulous-ciliate leaves and bracts.

A. viminEUS, Lam., var. **saxatilis.** Stem slender, 1.5 to 6 dm. high: leaves mostly ascending: the rather stiff very ascending or rarely spreading branches short (5 cm. or less), leafy-bracteate, terminated by solitary heads often 1.5 cm. across; or the branches longer with the heads solitary at the tips of the remote slender branchlets. — A characteristic plant of northeastern river-banks and ledgy shores, flowering from late July to early September. Maine, ledgy banks of the Penobscot, Mattawamkeag, September, 1898, in fruit, Pushaw Bridge, Oldtown, September, 1897, Upper Stillwater, July 29, 1895, no. 361 (*M. L. Fernald*), Orono, August, 1881 (*Kate Furbish*); rocky banks of the Kennebec, Madison, August 21, 1894 (*M. L. Fernald*); ledges by the Androscoggin, Gilead, September, 1897 (*Kate Furbish*); Woodstock, August, 1887 (*J. C. Parlin*): Quebec, Pangan Falls, Gatineau River, Sept. 6, 1894 (*John Macoun*). — The northern representative of *A. vimineus*, var. *foliolosus*, Gray, for which it has generally passed. That variety, however, as understood by Dr. Gray and as shown by his specimens, is a taller plant with more spreading and elongated branches, the much smaller heads more abundant and on shorter branchlets.

A. paniculatus, Lam., var. **cinerascens.** Stem slender, 7 to 9 dm. high, closely covered, especially above, with short cinereous hirsute pubescence: leaves dull green, thick, lanceolate, acuminate, with slightly clasping bases, strongly scabrous on the upper surfaces, scabridulous beneath and sparingly pubescent on the veins; margins entire or with closely appressed teeth: panicle ascending, with many medium-sized heads: involucre about 5 mm. high; the linear-attenuate appressed 4- or 5- seriate bracts with distinct green midveins, dark subulate tips and scarious sciliate margins: rays linear, pale lavender, about 1 cm. long. — Collected in a damp thicket at Veazie, Maine, Sept. 15, 1897 (*M. L. Fernald*). A plant with the inflorescence of *A. paniculatus*, and apparently a form of that species; but in its cinereous pubescence suggesting *A. undulatus*.

A. tardiflorus, L., var. **vestitus.** Similar to the species: the stem densely villous; the leaves somewhat so beneath. — Gravelly shores and low thickets, northern and central Maine, and in the Franconia region of New Hampshire. Maine, Dover, Sept. 1, 1894, Sept. 19, 1896, Van Buren, Sept. 11, 1896, Masardis, Sept. 8, 1897 (*M. L.*

Fernald) : New Hampshire, Lovers' Walk, Lisbon, Oct. 4, 1887, Sept. 17, 1888, Littleton, Sept. 15, 1888, Wallace Hill Road, Bethlehem, Sept. 19, 1888, near Profile House, Sept. 22, 1888, etc. (*E. & C. E. Faxon*). Passing imperceptibly through less pubescent specimens to the glabrous form.

A. puniceus, L., var. **compactus** (*A. puniceus* × *tardiflorus*, var. *lancifolius*, Fernald, Bot. Gaz. xxi. 278). Further study of this plant, both in the field and in the herbarium, has shown it to be a very characteristic form of *A. puniceus*. In the fall of 1896 an extensive area was examined by Mr. Walter Deane and the writer, on the banks of the Mystic River in West Somerville, Massachusetts, where this plant was very luxuriant and predominated over all other species. The plants were evidently fertile, and, though a careful search was made, no specimens of *A. tardiflorus* or its var. *lancifolius* could be found in the region. During the same year the plant was collected by Mr. Robert Cameron in Northampton, Massachusetts; in the fall of 1897, Mr. J. M. Greenman secured it at Walpole, Massachusetts; recently Miss E. L. Shaw has called my attention to it in Lexington, and Dr. G. G. Kennedy has shown me specimens collected by him at Milton, in 1894. A plant from New Haven, Connecticut, collected by Mr. A. L. Winton, is also very near this variety.

Only at the original station for this plant, at Ashland, Massachusetts, has *Aster tardiflorus*, var. *lancifolius* been found with it. There these two plants and typical *A. puniceus* were collected together in 1878 by the late Dr. Thomas Morong; and it was this evidence which first suggested that the plant was a possible hybrid. In view of the extensive range of the plant, its almost general isolation from one or both of the supposed parents, and its tolerably constant characters, there seems little ground to regard it a hybrid. On the other hand, though the typical form of the plant is quite unique in habit, many forms occur which connect it directly with true *A. puniceus*. For this reason it seems best to treat it as a variety of this species. *Aster puniceus*, var. *compactus* was described as a hybrid in the Botanical Gazette, and there is little to add to the characterization as there published. Its characters may be briefly summarized as follows: —

Stem stout, hispid: leaves very thick, narrowly sub-rhomboidal in outline, with unequal coarse often spreading teeth: branches of the inflorescence generally distinctly shorter than the large upper leaves, monocephalous or with many compactly clustered large violet heads, about 1 cm. high (not 4 to 6 in. as accidently printed in the original description).

Among some plants brought by Mr. Robert Cameron in 1896 from Northampton, Massachusetts, to the Harvard Botanic Garden was a hispid form of *Aster puniceus*, in inflorescence somewhat resembling the var. *compactus*, but with the lanceolate leaves much narrower than

in that form, and even more elongated than in the ordinary broadly branching *A. puniceus*. This narrow-leaved plant is identified without hesitation with Lindley's var. *demissus*, described and figured in the Botanical Register. Other specimens have since been examined from central Maine, though in these the elongation of the leaf is not so striking as in Mr. Cameron's plant. The var. *demissus* may be briefly described as follows: —

A. puniceus, var. demissus, Lindley, Bot. Reg. xix. t. 1636. Stem hispid as in the species: leaves elongate-lanceolate with scattered coarse teeth: inflorescence much as in var. *compactus*. — In low ground, either with the species or by itself, Somerset County, Maine (*J. F. Collins*); Orono, Maine (*M. L. Fernald*); Northampton, Massachusetts (*Robert Cameron*).

Another striking form of *Aster puniceus* has recently been described by me in the Ottawa Naturalist (xiii. 105) as var. *oligocephalus*. This is the smoothish few-headed form of Oakes Gulf and Tuckerman's Ravine, with conspicuous foliaceous outer bracts. It occurs also on the northern shore of Lake Superior and in Newfoundland and Labrador.

The following key to the New England forms of *Aster puniceus* may be of assistance to students of the group: —

Branches of the inflorescence, in well-developed plants, much exceeding the subtending leaves.
- Stem conspicuously hispid: leaves oblong-lanceolate, regularly but remotely serrate, hispid on the midribs beneath: involucral bracts long-attenuate . . . . *A. puniceus*, L.
- Stem glabrous or sparingly hispid above: leaves lanceolate, glabrous beneath.
  - Leaves sharply serrate: inflorescence mostly loose and open-paniculate: involucral bracts long-attenuate . *A. puniceus*, var. *laevicaulis*, Gray.
  - Leaves entire: heads thyrsoid-paniculate on elongated leafy branches: involucral bracts less attenuate . *A. puniceus*, var. *lucidulus*, Gray

Branches of the inflorescence shorter than, or slightly exceeding, the subtending leaves.
- Stem conspicuously hispid: leaves coarsely and irregularly toothed: heads many, crowded: involucral bracts all attenuate.
  - Leaves elongate-lanceolate, hispid on the midribs beneath . . . . *A. puniceus*, var. *demissus*, Lindl.
  - Leaves sub-rhomboidal, smooth or sparingly hispidulous on the midribs beneath . . . . . . *A. puniceus*, var. *compactus*, Fernald.
- Stem glabrous, or sparingly pubescent above: leaves lanceolate or oblong-lanceolate, entire or subentire, glabrous and somewhat lucid beneath: heads few or solitary, usually subtended by leafy bracts, and with foliaceous outer involucral bracts . *A. puniceus* var. *oligocephalus*, Fernald.

Solidago Virgaurea, L., var. **calcicola**. Stems clustered, erect, about 1 m. high, purplish, glabrous below, puberulent and somewhat glutinous above, simple or with a few erect branches, very leafy throughout: lower stem-leaves 1 to 1.5 dm. long, broadly oblanceolate, acuminate, sharply and irregularly serrate above the middle, entire

below, narrowed to a conspicuous broad-winged petiole-like portion; upper leaves long-acuminate, serrate above, somewhat narrowed to a sessile base, all rather large, 0.5 to 1 dm. long, 1 to 3 cm. broad: inflorescence ample, dense, thyrsoid-paniculate: involucre 5 to 7 mm. high, the short outer bracts ovate-lanceolate, the inner oblong-linear, all blunt, or rarely acutish: achenes sparingly pubescent. — In damp woods, with *S. macrophylla*, Pursh, near the boundary between Limestone, Aroostook County, Maine, and Grand Falls Township, Victoria County, New Brunswick, Sept. 10, 1896 (*Robert Cameron* and *M. L. Fernald*). A handsome plant unlike other American forms of *S. Virgaurea* in its very tall stature and large upper leaves, which, with the dense inflorescence, give it a general resemblance to large forms of the more southern *S. Elliottii*. A fine clump of this large variety has flowered profusely in the Harvard Botanic Garden for three seasons.

Gray Herbarium.

ON THE FLORA OF MT. ABRAHAM TOWNSHIP, FRANKLIN COUNTY, MAINE.

C. H. Knowlton.

Mt. Abraham township is crossed by the forty-fifth parallel of latitude, and contains the range of mountains bearing on the maps the name of Mt. Abraham. It is uninhabited, and heavily wooded except in the higher regions. The range consists of three parts, two of which form the horseshoe-like mountain known as Mt. Abraham. The third part, next to Redington plantation, is called Bald Mountain, and is the highest portion of the range. The part of Mt. Abraham proper which is nearest to Salem is wooded nearly to the top; the other two peaks are bare. Deep valleys or "sags" separate the three parts from each other. The altitude of the mountain is nominally thirty-eight hundred feet, though it may never have been accurately measured.

It was my privilege to explore this township botanically, July 3–6, 1899, and the flora proved very interesting. The slopes of the range were heavily wooded, principally with *Betula papyrifera*, *B. lutea*, *Abies balsamea* and *Picea rubra*, the fir appearing to be more abundant than the spruce. There was an undergrowth of *Acer spicatum*, *Pyrus Americana*, *Amelanchier oligocarpa*, *Nemopanthus fascicularis* and *Ribes prostratum*. *Acer rubrum*, *Cornus alternifolia* and *Taxus Canadensis* were occasional on the lower slopes, *Sambucus racemosa* and *Viburnum cassinoides* toward the top. The mossy woods were full of

Oxalis Acetosella; and *Trientalis Americana* and *Maianthemum Canadense* were frequent. Every open space was filled by *Aspidium spinulosum*. This was the only abundant fern, though on the lower slopes it was accompanied by *Phegopteris polypodioides* and *Asplenium Filix-foemina*. Strangely enough, however, there was an isolated patch of these two on the bare part of the middle range, far above any other ferns. *Chiogenes serpyllifolia*, *Solidago macrophylla*, *Linnaea borealis* and *Goodyera repens* grew in the upper regions. The only *Carices* in the mountain woods were *Carex intumescens*, *C. rosea*, *C. laxiflora* and *C. canescens*, var. *alpicola*, and these were not abundant. No grasses were found.

The first range of the mountain is so heavily wooded that it bore nothing strictly alpine. An open place near its highest peak was covered with *Rumex Acetosella*, which grew with all the assurance of a native. The second range was also disappointing. It is very rocky, and the principal plants were *Poa nemoralis*, *Anaphalis margaritacea*, *Kalmia angustifolia*, *Vaccinium Vitis-Idaea*, *V. uliginosum*, *V. Pennsylvanicum*, *Ledum latifolium* and *Empetrum nigrum*. Narrow-leaved alpine forms of the last three plants were as common as the typical forms. *Lycopodium annotinum*, var. *pungens*, was also present, shading imperceptibly into the type. *Cornus Canadensis* was in blossom everywhere.

Bald Mountain is the highest part of the range, and furnished the most interesting field. Here, for the first time on the range, occurred a few patches of sphagnum peat, and in this grew *Comandra livida*, *Vaccinium Oxycoccus* and *Kalmia glauca*. Higher up on the exposed parts, near the summit, grew *Juncus trifidus*, *Diapensia Lapponica*, *Selaginella rupestris*, and, at the very summit of Bald Mountain, at the highest point of the range, grew a large mass of *Carex rigida*, Gooden., var. *Bigelovii*, Tuckerm. (*C. vulgaris*, Fries, var. *hyperborea*, Boott.).

A comparison with the flora of Mt. Saddleback, about ten miles away, reveals certain differences. *Arenaria Groenlandica*, *Vaccinium caespitosum* and *Calamagrostis Langsdorfii*, which grow near the "pinnacle" of Saddleback, do not occur on Abraham. This lack, it seems to me, must be ascribed to the aridity of the range, rather than to any great difference in altitude. Saddleback abounds in springs, and has a rainwater pond on top, and great masses of sphagnum are frequent, while the entire Abraham range is dry, and has only a very few patches of sphagnum.

From the summit of Bald Mountain we went down into the valley of Rapid Stream, at least twelve hundred feet below. This is a deep wooded valley, shut in by mountains on three sides. This region furnished several interesting plants. *Ribes lacustre* replaced *R. prostratum*. *Alnus viridis* and *Acer spicatum* grew luxuriantly, one specimen of the former being four inches in diameter at the base. Here also grew *Pyrola asarifolia*, *Moneses grandiflora*, *Listera convallarioides*, *Habenaria obtusata* and *H. dilatata*.

One of the most noticeable features of the mountain flora was the lateness of flowering. *Sambucus racemosa* and *Maianthemum Canadense*, which were well fruited away from the mountain, were found in full bloom on cold slopes near the summits. *Trientalis Americana*, *Ledum latifolium*, *Acer spicatum* and *Cornus Canadensis*, which had elsewhere finished blooming two to four weeks earlier, were still blossoming here.

GOODYERA PUBESCENS IN CENTRAL NEW HAMPSHIRE. — In Mr. Fernald's synopsis of the New England species of *Goodyera* in RHODORA for January, it is stated that, for *G. pubescens*, the northernmost station in New Hampshire is Jaffrey. I have found the plant in great abundance, growing in rich moist woods bordering a swamp on the road from "The Weirs" to Meredith Centre. In the same woods were a few plants of *G. tesselata*, never more than one in a spot, whereas *G. pubescens* grows, as in southern New England, in large patches. — PHILLIPS BARRY.

LACTUCA MORSSII IN MAINE. — The new wild Lettuce described in the January number of RHODORA, and named *Lactuca Morssii*, grows in Maine in the Kennebec valley. I find in my Herbarium a specimen of it, which I gathered August 2, 1897, by the side of an old country road about two miles from Skowhegan village. — LOUISE H. COBURN, Skowhegan, Maine.

[The identity of this specimen, recognized by Miss Coburn, has been fully confirmed by a comparison with the type at the Gray Herbarium. — ED.]

A METHOD OF OBTAINING BAYBERRY WAX. — In "Cape Cod" Thoreau tells of obtaining fine green wax from the berries of the bayberry

(*Myrica cerifera* L.). Others, who have tried to do the same thing and failed, may be prompted to test the following method, adopted with success by Mrs. Henrietta Page: —

"Eight quarts of bayberries were boiled in water, only a small globule of melted wax appearing on the surface — a discouraging result for one whose hopes are large and whose persistence is small. It appeared that most of the wax was still clinging to the berries. They were therefore thrown into a colander lined with a muslin bag, and allowed to drain thoroughly. As many nuggets of wax were still visible, the mass was heated and drained a second time. As the liquid cooled, a thin cake of wax was formed on the surface. This was taken off and allowed to cool slowly, to prevent cracking. The amount obtained from eight quarts of October berries was two and one half ounces, a very satisfactory reward for the labor."

THE LOCAL FLORAS OF NEW ENGLAND.

Mary A. Day.

(Continued from page 178.)

Massachusetts.

Suffolk County: —

194. Notes on some flowering shrubs and herbaceous perennials, growing in the vicinity of Boston. Hovey's Mag. v. 1839, pp. 175–178. Select. spec., popular treatm. *phaenog.*
By a member of the Mass. Hort. Society.

195. **Bigelow, Jacob.** Florula Bostonensis. A collection of plants of Boston and its environs, with their generic and specific characters, synonyms, descriptions, places of growth, and time of flowering, and occasional remarks. Boston, 1814, pp. 268. Descr. manual. *phaenog.* and *vasc. cryptog.*

—— —— ed. 2, greatly enlarged, to which is added a glossary of botanical terms employed in this work. Boston, 1824, pp. 422.

195. —— —— ed. 3, enlarged, and containing a glossary of botanical terms. Boston, 1840, pp. 468.

"Ed. 3 was the last flora or manual published in this country arranged upon the Linnean artificial system." A. Gray.

Review of ed. 1, by C. S. Rafinesque. Am. Month. Mag. ii. 1817–1818, pp. 342–344.

196. **Farlow, William Gilson.** List of Fungi found in the vicinity of Boston. Bull. Bussey Inst. i. 1876, pp. 430–439; ii. 1878, pp. 224–252. Annot. catalog. *cryptog.*

197. —— Remarks on some Algæ found in the water supplies of the City of Boston. Bull. Bussey Inst. ii. 1877, pp. 75–80. Select. spec., popular treatm. *cryptog.*

198. **Gray, Asa.** The flora of Boston and its vicinity, and the changes it has undergone. In Winsor, J. Memorial history of Boston, i. 1880, pp. 17–22. Select. spec., popular treatm. *phaenog.* B. P.

199. **Harris, Thaddeus William.** List of native plants discovered growing near Boston, the present season — in a letter read before the Massachusetts Horticultural Society. Hovey's Mag. vi. 1840, pp. 245–247. Select. spec., popular treatm. *phaenog.*

200. **Kenrick, Enoch Brown.** Beautiful plants growing wild in the vicinity of Boston. Hovey's Mag. i. 1835, pp. 368–377, 411–418, 453–458; ii. 1836, pp. 14–17, 55–57, 131–134, 171–174. Selec. spec., popular treatm. *phaenog.*

201. **Perkins, Charles Edward.** Ballast plants in Boston and vicinity. Bot. Gaz. viii. 1883, pp. 188–190. List. *phaenog.*

202. **Stodder, Charles.** [List of Diatomaceæ found in a small stream in West Roxbury, in July, 1858.] Proc. Bost. Soc. Nat. Hist. vii. 1859, pp. 26–27. List. *cryptog.* N. H.

203. **Young, Herbert Andrew.** Catalogue of the flora of Oak Island, Revere, Massachusetts. Bull. Essex Inst. xiv. 1882, pp. 141–157. Reprint, 1883, pp. 19. Annot. catalog. *phaenog.* and *cryptog.*

Worcester County: —

204. **Ammidown, Lucius Edwin.** The flora of Southbridge. Southbridge Journal, July 28, August 4, 1882. Supplement. Southbridge Journal, November 9, 1883. Annot. catalog. *phaenog.* and *vasc. cryptog.* Mr. Ammidown's library. Not seen.

205. **Jackson, Joseph.** Additions to the flora of Worcester County. Camp and Lake, No. 1, June 12, 1889. List with notes. *phaenog.* Mr. Jackson's library.

206. —— Catalogue of the phaenogamous and vascular cryptogamous plants of Worcester County, Massachusetts. Worcester, 1883, pp. 48. Annot. catalog. *phaenog.* and *cryptog.*

—— —— ed. 2, 1894. Bound with his Through glade and mead.

207. —— [Plants of Worcester County]. Worcester Daily Spy, May, 1882–March, 1884. Lists with notes. *phaenog.* and *vasc. cryptog.* Mr. Jackson's library.

Arranged according to seasons.

208. —— Through glade and mead. A contribution to local natural history appendix A. Flora of Worcester County. A catalogue of the phænogamous and vascular cryptogamous plants of Worcester County, Massachusetts. 2d edition, revised and enlarged. Worcester, 1894. Illus. Select. spec., popular treatm.; also Annot. catalog. *phaenog.* and *cryptog.*

209. **Russell, John Lewis.** Notice of some rare and beautiful plants found in Hubbardston, Massachusetts, during the months of May, June, July, and August, 1837. Hovey's Mag. iii. 1837, pp. 410–413. Select. spec., popular treatm. *phaenog.*

210. **Simonds, Arthur Beaman** *and others.* Catalogue of the phænogamous and vascular cryptogamous plants of Fitchburg and vicinity. Fitchburg, 1885, pp. 39. Annot. catalog. *phaenog.* and *vasc. cryptog.* M. H.

The authors' names on the title page are Arthur Beaman Simonds, Class of '86, George Francis Whittemore, Class of '86, William Gardner Farrar, Class of '87, Emery Adams Hartwell, Science Teacher.

211. **Stone, George Edward.** Additions to the flora of Worcester County. Camp and Lake, ii. 1890. Three articles. List. *phaenog.* and *cryptog.* Dr. Stone's library. Not seen.

212. **Tucker, Arabella Hannah.** Trees of Worcester. A list of the trees both native and introduced, that grow in our streets and grounds, together with their locations. With illustrations from photographs by Juliet Porter. Worcester, 1894, pp. 98. Illus. Select. spec., popular treatm. *phaenog.*

(To be continued.)

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TWO NEW SPECIES OF MARINE ALGAE FROM BRIDGEPORT, CONNECTICUT.

ISAAC HOLDEN.

FOR some years past, both marine and fresh water algae have been so persistently sought for in the waters of Bridgeport and vicinity that additions, even to the local list, are not now very frequent. It is a source of some satisfaction, therefore, to be able to report the two following species, which seem to be quite new and certainly have some interesting peculiarities. Perhaps no species of *Hydrocoleum* has heretofore been reported from still water (See Gomont's Monographie des Oscillariées).

The only stations in which the two plants have as yet been found, though carefully sought for elsewhere, are in the same marsh and only a few rods apart.

Hydrocoleum majus, n. sp. Stratum dark aeruginous. Sheaths agglutinated, forming mostly an amorphous, gelatinous, diffluent mass, from which the outer extremities of the trichomes project, naked or enveloped in broad ragged sheaths, or the trichomes escape entirely and become independent. Trichomes aeruginous, not contracted at the nodes, 25–30 μ in diameter; articles 5–10 times shorter than the diameter of the trichome (3–6 μ long); dissepiments granulated; apex attenuate-truncate; apical cell conspicuously calyptrate.

Found in brackish marsh ditches, forming a gelatinous, tubular coating on old stems of *Spartina*, later floating; occurring at Bridgeport, Connecticut, in late spring and early autumn, disappearing in winter and in the heat of summer. Distributed in Collins, Holden and Setchell, Phycotheca Boreali-Americana, No. 602.

The writer first collected this plant in May, 1896, and has since observed its appearance regularly in May and September, except in the autumn of 1898, when it failed to appear at all.

As it seems that there are no well-defined sheaths containing a number of trichomes each, it may be doubted whether this plant, notwithstanding its size, should not rather be named *Phormidium majus*, but upon the whole its characteristics seem to accord better with *Hydrocoleum*. Maybe there is no hard and fast line between the two genera.

Stictyosiphon subsimplex, n. sp. Mature fronds from a few millimeters to 12 centimeters in length, hardly reaching one half millimeter in width, simple or very sparingly branched. Occasionally a frond, otherwise simple, has a tuft of very short branches at the summit. Young fronds distinctly articulate. Sporangia (plurilocular? — apparently unilocular) mostly very prominent, often nearly spherical, occurring singly or in groups.

Found at Bridgeport, Connecticut, in a large salt-marsh pool, on *Ruppia maritima*, and only in company with *Ectocarpus subcorymbosus* Farlow, although other species of *Ectocarpus* are growing at the same time on *Ruppia* and other plants in the same pool. It appears in late May or early June and again in autumn. It is, so far as observed, very short-lived, appearing, fruiting and disappearing within a very few days. Although occurring, so far as yet observed, only in association with *Ectocarpus subcorymbosus*, no parasitic or essentially symbiotic relation between the two plants is apparent. It is distributed as No. 630 of the Phycotheca Boreali-Americana.

Although this *Stictyosiphon* is apparently more substantial than the *Ectocarpus* with which it is associated, it is in reality much more delicate and extremely impatient of changing conditions. The first collection (made Nov. 14, 1897) was left for future examination in a large porcelain dish with an abundance of water from the pool in which it grew. A day or two later it was found that while the *Ectocarpus* was in prime condition, the *Stictyosiphon*, probably in consequence of the temperature of the room having risen too high, had gone to pieces and utterly disappeared.

Explanation of Plate 9. — Figures 1–6, *Stictyosiphon subsimplex*. 1, Several plants on *Ruppia maritima*, which is densely covered with *Ectocarpus subcorymbosus*. 2, Monosiphonous end of frond, with terminal hair. 3, Somewhat older portion of frond, the form of the original cells still showing, though now covered by smaller cells. 4, Portion of mature frond, with sporangia and lateral hairs. 5, Portion of frond with two very prominent sporangia and a lateral hair. 6, Cross section of frond in about the same state as in fig. 4.

Figures 7–8, *Hydrocoleum majus*. 7, Trichome with terminal calyptra. 8, Same, more highly magnified.

SOME ORCHIDS OF THE UPPER PEMIGEWASSET VALLEY.

W. S. C. Russell.

At the southern entrance of the Franconia Notch, the Pemigewasset valley sends out a lateral branch to the east and one to the west. The eastern valley, which is broad and fertile, is drained by the east branch of the Pemigewasset River; the main branch of the river drains the notch itself and the western valley, which ramifies rapidly into smaller valleys and ravines, receives the waters of many brooks and streams draining an area of mountains covering thousands of acres.

Little is known of the plant life of the remoter mountain glades, and the little that is known has been gleaned chiefly by following the trails and from inference. There are scores of mountain meadows and deep ravines, which the botanist has never explored. The writer has spent considerable time tramping and camping in the forests which cover the mountains, and has enriched his collections by the addition of orchids, many of which are rare or unknown in the valley. The following notes on these plants taken from his memoranda in Gray's Manual may prove of interest to the readers of Rhodora.

1. *Aplectrum hiemale*, Nutt. On Jackman brook, in a hollow where ferns are abundant, July 7, 1894. I have found it but once since. Rare, local.

2. *Corallorhiza innata*, R. Brown. In a mountain meadow, or bog, near the outlet to Russell pond on the summit of Russell mountain, not common.

3. *Corallorhiza multiflora*, Nutt. In the hemlock forest between Jackman brook and Crooked brook; very common along the latter.

4. *Spiranthes Romanzoffiana*, Cham. Same locality as No. 2, and occasionally met with in the mountain glades.

5. *Spiranthes gracilis*, Bigelow. This pretty orchid is very common in the sandy cart-roads and borders of fields along the Pemigewasset.

6. *Spiranthes cernua*, Richard. Same localities as No. 5.

7. *Goodyera tesselata*, Loddiges. This species is very common in the vicinity of the Agassiz basin; in glades and coniferous woods.

8. *Goodyera repens*, R. Br. var. *ophioides*, Fernald. Frequent from the head waters of the Lincoln and Franconia branches westward to the eastern slopes of the Kinsman mountains and Moosilauke.

9. *Pogonia ophioglossoides*, Nutt. Near Boy pond and Elbow pond, not common.

The Habenarias are well represented in this region and I meet most of the following species every season while tramping along the brooks.

10. *Habenaria tridentata*, Hook. Below the railroad bridge, abundant; frequent in the Pondfield meadows.

11. *Habenaria hyperborea*, R. Br. Likely to be met with anywhere in wet places on the slopes of the mountains forming the valley. At Beaver Falls, on the eastern slope of Moosilauke, I found hundreds of this stately plant in a wild, deep ravine on August 1, 1895, and I named one portion of the falls, "Orchid Falls."

12. *Habenaria dilata*, Gray. Frequent near Echo Lake and the Basin in the Notch.

13. *Habenaria Hookeri*, Torr. On the Warren road, amidst dense mats of *Linnaea borealis*. I have found it once in August, 1896, and once this year — only one specimen badly worm-eaten.

14. *Habenaria orbiculata*, Torr. Very common in old logging roads in the woods and deep forests; from two to a dozen are frequently found near each other.

15. *Habenaria fimbriata*, R. Br. This beautiful and showy orchid is common in the low grass lands along the river near thickets.

16. *Cypripedium pubescens*, Willd. Frequent in cold and shady bogs among the mountains.

17. *Cypripedium acaule*, Ait. Very abundant with *Epigaea repens* on the hillsides and ledges bordering the Pemigewasset.

Hydrastis Canadensis, L. in Vermont. — Last June Mr. F. H. Horsford of Charlotte informed me that one of his collectors of bulbs had brought in specimens of *Hydrastis Canadensis*. On August 8, after Mr. Horsford had kindly given me the necessary directions, I visited the station, which is in the town of Shelburne, and found a colony of twenty-five or thirty plants, from which I ventured to take three specimens. This is apropos of Mr. Bissell's note in Rhodora, vol. I, p. 157, regarding the occurrence of this species in Connecticut. — Ezra Brainerd, Middlebury, Vermont.

ADDITIONS TO THE FLORA OF WORCESTER COUNTY, MASSACHUSETTS. — II.

ROLAND M. HARPER.

SINCE the publication of my first article under the above title (RHODORA, **1**: 42, 43), I have succeeded in finding several more plants not previously known in Worcester County, and have at the same time somewhat extended the ranges within the county of most of the plants mentioned in that article. The recent revision of several groups of New England plants has also furnished some material for the present article.

During the year Dr. G. E. Stone has published a Flora of Lake Quinsigamond, which contains several plants not before recorded from Worcester County. Some of these I have collected also, in other parts of the county, and I have indicated them below by an asterisk.

The following *species* (and one hybrid) are not enumerated in Mr. Jackson's 1894 catalogue of Worcester County plants: —

**Potamogeton perfoliatus*, L. Lakes Quacumquasit and Quaboag, Brookfield, August 20.

Panicum filiforme, L. Dry sandy woods near Lake Quaboag, Brookfield, September 4.

Panicum virgatum, L. Lake Quacumquasit.

Aristida dichotoma, Michx. Dry sandy soil. Dudley, August 27; Southbridge, September 10; Sturbridge, September 17.

Aristida gracilis, Ell. Dry roadside, Sturbridge, September 17.

**Spartina cynosuroides*, Willd. In loose sand near the outlet of Lake Quacumquasit, Brookfield, August 13.

Poa compressa, L. Dry roadsides, open woods, rocky places, etc., common. Dudley, August 27; Sturbridge and Brookfield, September 4; Southbridge, September 10.

Cyperus inflexus, Muhl. Sandy shores of Lakes Quacumquasit and Quaboag, August 13.

Scirpus planifolius, Muhl. In dry deciduous woods, mostly on hills, Sturbridge, May 28 (elevation, 980 ft.); West Brookfield, May 30 (elevation, 920 ft.); Brookfield, August 20.

Scirpus debilis, Pursh. Very abundant on mud-flats along the Quinebaug River in the eastern part of Southbridge, July 30, August 27; extending down the river into Dudley; also sparingly along the

shore of Quaboag Lake (where it is almost hidden by larger plants), August 20.

**Scirpus pungens*, Vahl. A few specimens along the north shore of Lake Quacumquasit, August 13; very abundant along the north shore of Quaboag Lake (and extending some distance out into the water), August 20.

Hemicarpha subsquarrosa, Nees. Sandy shore of Lake Quacumquasit, August 13; gravelly shore of Quaboag Lake, August 20.

Carex utriculata, Boott. Wet meadows and bogs, Southbridge, May 26; Webster, June 11.

Carex bullata × utriculata, Bailey. A group of perhaps two or three dozen individuals of this supposed hybrid was found in a sphagnous meadow in Southbridge, in flower May 26, and apparently mature June 14. *C. utriculata* was a few rods away, but I saw no *C. bullata* in the vicinity.

Carex scabrata, Schw. "Gulf Woods" (May 20), and other wet places in Southbridge.

Carex torta, Boott. One specimen or clump found growing on the bank of an artificial canal near the Quinebaug River, Southbridge, June 6. Probably originated from seed transported from some station farther up the river.

Carex tenella, Schk. Wet woods, Southbridge (two stations), June 8 and 27. Associated with *C. polytrichoides*, Muhl., which it resembles in its filiform leaves and culms.

Carex foenea, Willd. Dry thicket. Southbridge, July 15.

Carex albolutescens, Schw. Dry woods. Southbridge, June 14.

Orontium aquaticum, L. Three or four specimens, without fruit, in a muddy ditch near the Quinebaug River, Dudley, July 30 (elevation, 400 feet).

Juncus Greenii, Oakes & Tuckerm. Dry sandy soil. Near Quaboag Lake, Brookfield, August 20 (elevation, 630 feet), September 4 (elevation, 680 feet); near Quinebaug River, Dudley, August 27 (elevation, 400 feet).

Stellaria graminea, L. Roadside, Dudley, June 11. Closely resembles *S. longifolia*, Muhl., which grows near it.

Berteroa incana, DC. Three or four depauperate specimens of this new weed were found in a dry hayfield in Southbridge, August 17. One specimen was sent to Prof. L. H. Dewey, assistant botanist of the U. S. Dept. of Agriculture, who confirmed my identification.

**Elatine Americana*. A few inches under water in the north end of Lake Quacumquasit, Brookfield, September 4.

Apocynum hypericifolium, Ait. (*A. cannabinum* var. *hypericifolium*, Gray). Dry sandy soil near Quinebaug River, Southbridge, August 17; lake shores, Brookfield, September 4.

Centaurea nigra, L. Dry roadsides, Hardwick, July 2. Not mentioned in Mr. Jackson's catalogues, but recorded from Hardwick as early as 1829, by Dr. Hitchcock (Catalogue of plants growing without cultivation in the vicinity of Amherst College, p. 19).

The following plants are *varieties* (new to the county) of species already known in the county: —

Eleocharis obtusa, var. *jejuna*, Fernald. Bottom of dried-up pool in woods near Hatchet Hill, Southbridge, September 10.

Eriophorum gracile, var. *paucinervium*, Engelm. In a small bog, surrounded by woods, near the summit of Shumway Hill, Sturbridge, July 23 (elevation, 980 feet).

Carex stricta, var. *angustata*, Bailey. In wet meadows, generally with the type and almost as common, Southbridge, May 14; Dudley, June 11.

Carex stricta, var. *strictior*, Dew. Wet meadows near the Quinebaug River, Sturbridge, May 28; Dudley, June 11.

Carex laxiflora, var. *patulifolia*, Carey. Grows in crevices of cliffs facing eastward, on rich shady hillsides, often with the similar *C. platyphylla*, Carey. Southbridge, May 14.

Carex tribuloides, Wahl. (the type). Moist shaded meadow. Southbridge, June 9.

Polygonum acre, var. *leptostachyum*, Meisn. Along lakes and rivers, Brookfield, August 13 and 15.

Of the plants of the *Scirpus Eriophorum* group, as recently revised by Mr. M. L. Fernald (Proc. Amer. Acad. XXXIV, pp. 498–503), I have collected the three following in Worcester County: —

Scirpus Eriophorum var. *cyperinus*, Gray (*Eriophorum cyperinum*, L.) is the common form, in wet places throughout the county.

Scirpus Eriophorum, var. *condensatus*, Fernald. In rather dry sandy soil, near Wallum Pond, Douglas (and extending southward into Rhode Island), August 6.

Scirpus atrocinctus, Fernald. Quite common in wet meadows, Southbridge, June 6; Charlton, June 18; New Braintree and Dana, July 2; and at 1990 feet on Mt. Wachusett, July 4.

Of the seven species and two varieties of *Antennaria* now known in Massachusetts (see Rhodora, **1** : 160), I have thus far distinguished six in Worcester County, as follows : —

A. Parlinii, Fernald. This handsome species is usually found in partially shaded situations, often on a sloping bank by the roadside, or occasionally in moist meadows, not common, Southbridge, May 7 (in flower) ; Sturbridge, May 28 ; Warren, May 30 ; Leicester and Charlton, June 4 (akenes beginning to fall). Extends southward into Connecticut. Only pistillate specimens found.

A. Canadensis, Greene. Gravelly shore of Lead Mine Pond, Sturbridge, May 28 (pistillate only) ; also seen without flowers along unfrequented roads or in dry open places, Charlton, August 13 ; Sturbridge, September 4 ; Southbridge, September 10.

A. plantaginea, R. Br. Dry fields, woods, roadsides, etc., very common and variable. (Staminate and pistillate.)

A. plantaginea, var. *petiolata*, Fernald. Fields and roadsides, Southbridge, often with the type. (Staminate and pistillate.)

A. neodioica, Greene. In dry fields, woods, etc., especially among rocks. Pistillate plant quite common. Staminate plants found only once, in a cluster of about twenty individuals or flowering stems, spreading over an area of one or two square feet, by a roadside in Southbridge, with some pistillate plants in close proximity. This is the first and only known station for staminate *A. neodioica* in New England.

A. neglecta, Greene. Dry pastures, roadsides, or even in sphagnous wet meadows, common. The wet meadow form usually has larger leaves (sometimes 5.5 cm. long), smooth or nearly so above, and fewer stolons.

Further study of this interesting genus will no doubt reveal other species in the county than those listed above.

The following plants of my previous article have been collected this year in additional stations : —

Spirodela polyrrhiza. Southbridge, August 13 ; Brookfield, August 20.

Glyceria elongata. Royalston, July 2.

Glyceria pallida. Southbridge, June 27.

Panicum proliferum. Shore of Quaboag Lake, Brookfield, August 20.

Carex laxiculmis. Dudley, July 30.

Cladium mariscoides. Quaboag River marshes, Brookfield, June 18.

Eleocharis Robbinsii. Shallow water, Douglas, August 6.

Rhynchospora alba. Douglas and Dudley, August 6.

Juncus bufonius. Apparently common throughout. Seen as far north as Royalston, July 2.

Polygonum hydropiperoides. Sturbridge, July 23; Brookfield, August 20; Dudley, August 27.

Linum Virginianum. Dudley, August 27.

Gerardia purpurea, var. *paupercula.* Brookfield, August 20; Southbridge, September 10. Am inclined to believe that all the *G. purpurea* in Worcester county may be referred to this variety.

Rumex verticillatus, in my former article, should be *R. Britannica,* L., a very similar species. I am indebted to Mr. W. P. Rich for calling my attention to this error, after examining one of my specimens. I have collected it also in Brookfield, August 20.

With a few unimportant exceptions, specimens of the plants mentioned in this article have been examined by Mr. Fernald, and placed in the herbarium of the N. E. Botanical Club.

THE WHITE BLACKBERRY.

Ann Maria Mitchell.

The so-called "white blackberry" is recognized as a distinct variety of blackberry by Prof. L. H. Bailey in his Evolution of our Native Fruits, 1898, where it is given the name of *Rubus nigrobaccus,* var. *albinus* Bailey. In this work he refers to what seems to be the first mention of this plant, where he reports it in American Gardening for 1890 under the name of *Rubus villosus,* var. *albinus* Bailey. Professor Bailey's discovery that the *Rubus villosus* of Aiton is really our common dewberry explains the change in the specific name.

The plant in question is reported by Professor Bailey as occurring in certain localities from New York to Michigan. This summer I found a bush in Hinsdale, New Hampshire, a town in the Connecticut valley. The bush was between three and four feet high, with foliage resembling that of the common high blackberry, but of a lighter green. The ripe berries were of an amber or flesh color, from one-half to three-fourths of an inch in length, sweet and juicy, though hardly so highly flavored as the common blackberries.

Inquiry revealed the fact that the "white blackberry" was known to many of the veteran berry-pickers of the locality, though I heard of

no one who had ever seen more than a single bush or who regarded it otherwise than as a curiosity.

The plant which I found grew in a partially cleared woodland which contained an abundance of the common high blackberry, but careful search revealed no other bush of the *albinus* variety. The white berries are reported as having been seen in a mountain pasture two or three miles from where I found this bush and in the adjoining town of Chesterfield.

As I could find no report of any such blackberry in the works of reference which I had at hand, I wrote to Harvard inquiring if any record had been made of them. I was requested to send some of the fruit for preservation at the Botanical Museum at Cambridge, with some of the leaves and stem for use at the Gray Herbarium. The plant was identified as the one described by Professor Bailey as the *albinus* variety of *Rubus nigrobaccus*, but not hitherto reported from New England.

The fruit in alcohol has been deposited on the shelves of the Botanical Museum, and the fruit together with the stem and leaves preserved at the Gray Herbarium. The bush has been carefully marked and effort will be made to secure some of the flowers another season.

ADVENTITIOUS PLANTS OF DROSERA.

ROBERT G. LEAVITT.

(Plate 10.)

THE propagation of *Drosera filiformis*, *D. binata* and *D. dichotoma* from cut leaves was noted by Mr. Ames in the September RHODORA. From leaves placed in sphagnum August 5, new plants were first observed August 26. These shoots, the present aspect of which merits a note, have reached a point at which the leaves first produced and those characteristic of the species are seen standing together and offering in the same plantlet marked contrasts, as well as gradations, of form. The peculiarities may be gathered from the accompanying plate.

Figures 1–4 represent, enlarged, the young condition of *D. binata*. In 1 we have a shoot with the first six leaves, all orbicular and indistinguishable except in size from those of *D. rotundifolia* (fig. 6). Leaf 4*a* is rotund, 2 is later and sub-triangular, 3 later still and obreniform, 4*b*, *c* and *d* succeeding forms; *d*, though small, is practically the full character leaf. Fig. 5 represents the first five leaves (enlarged) of *D. filiformis*.

It must not be supposed, of course, that any individual leaf changes from rotund to binate. The forms represented are permanent. Mature plants, however, would not show the peculiarities now under discussion.

The phenomenon here presented, well known in seedlings, is worth notice for two reasons, first because of its bearings on the probable affinities of the species of *Drosera*, and secondly from its relation to the problem of heredity.

The studies of Dr. R. T. Jackson have shown stages of development in flowering plants, manifested in the shapes of the leaves, which are almost as striking from a genealogical standpoint as the steps of development which give rise to the embryo within the embryo-sac. Dr. Jackson's palaeobotanical researches have established the fact that in the leaves of the seedling we may often trace something of the plant's ancestry, in accordance with the familiar principle that ontogeny repeats phylogeny. The application of this generalization to the systematic botany of phaenogams is suggestive.

If we may trust Dr. Jackson's conclusions, the peculiar early leaves of *D. binata* would indicate the derivation of this species from *D. rotundifolia* through a series of plants the character leaves of which were successively triangular, obreniform, crescent-shaped, and finally elongated in two parts as at the present day.

Seedlings of *D. rotundifolia* have early leaves like *D. anglica* (a spatulate-leaved form), according to Sir John Lubbock; and this would imply the historical priority of the latter species or type over *D. rotundifolia* and *D. binata*.

The primitive leaves of *D. filiformis* (fig. 5), probably indicate the origin of this species from the progenitors of *D. rotundifolia*.

Interpreting the vestigial foliage of the above-mentioned *Drosera* species in this way we look back to a common archetype possessing elongated leaves. One line of descendants has kept this character, another has reduced the spread of blade to a minimum, in the filiform condition, while a third at first shortened and expanded the blade to orbicular and subsequently has modified this form into the curious double-forked linear leaf of *D. binata*.

With regard to the second point of interest, the young plants of *D. binata* precisely correspond to the description of the seedlings of the same species as given by Lubbock. The series of odd-shaped leaves serves to exhibit the noteworthy fact that individuals adventitiously derived parallel at all stages those derived from the egg-cell. With, of

course, such differences in the very earliest period as differences in mode and place of origin implies. The seedling, taking its rise from the ovary, manifests by its atavistic traits a youthfulness and freshness of life, a lack of well-formed character, and yet a racial stability. In plants originating from a quite different organ — and, in cases, tissue — of the plant-body, we find an equal rejuvenescence and equal adherence to hereditary tendencies. This seems to offer little support to a theory of distinct and localized germ-plasm.

North Easton.

Explanation of Plate 10. — Fig. 1–4, *Drosera binata*. Fig. 5, *D. filiformis*. Fig. 6, *D. rotundifolia*.

THE LOCAL FLORAS OF NEW ENGLAND.

Mary A. Day.

(Continued from page 196.)

Rhode Island.

General works: —

213. Native plants of Rhode Island. i–iv. Proc. Newport Nat. Hist. Soc. 1884–85, pp. 87–89; 1885–86, pp. 13–15; 1886–87, pp. 32–35; 1887–88, p. 24. Annot. catalog. *phaenog.* N. H.

214. **Bailey, William Whitman.** Among Rhode Island wild flowers. Providence, 1895, pp. 105. Select. spec., popular treatm. *phaenog.*

—— —— ed. 2, 1896.

215. —— Some notes on the flora of Rhode Island. Proc. Newport Nat. Hist. Soc. 1885–86, pp. 3–12. Select. spec., popular treatm. *phaenog.* N. H.

216. **Bennett, James Lawrence.** Plants of Rhode Island, being an enumeration of plants growing without cultivation in the State of Rhode Island. Providence, 1888, pp. 128. Annot. catalog. *phaenog.* and *cryptog.*

217. **Briggs, Samuel Arnold.** A contribution towards a list of Rhode Island Diatomaceæ. The Lens, ii. 1873, pp. 161–163. Select. spec., popular treatm. *cryptog.*

218. **Collins, James Franklin.** Notes on the Rhode Island flora. Bull. Torr. Club, xx. 1893, pp. 240–243. Select. spec., technic. treatm. *phaenog.*

219. [**Miller, John.**] WOODED AREAS [OF RHODE ISLAND]. THREE-FOURTHS OF THE STATE COVERED WITH TREES. Providence Sunday Jour. April 29, 1894. Select. spec., popular treatm. *phaenog.*

220. **Olney, Stephen Thayer.** ALGÆ RHODIACEÆ. A LIST OF RHODE ISLAND ALGÆ, COLLECTED AND PREPARED BY STEPHEN T. OLNEY, IN THE YEARS 1846–1848, NOW DISTRIBUTED FROM HIS OWN HERBARIUM. Providence, 1871, pp. 13. Also published in The Lens, i. 1872, pp. 129–135. Annot. catalog. *cryptog.*

221. —— CATALOGUE OF PLANTS COLLECTED BY THE BOTANICAL DEPARTMENT OF PROVIDENCE FRANKLIN SOCIETY, PRINCIPALLY IN RHODE ISLAND, IN 1844. Providence, 1845, pp. 8. List. *phaenog.* and *cryptog.*

222. —— RHODE ISLAND PLANTS, OR ADDITIONS AND EMENDATIONS TO THE CATALOGUE OF PLANTS PUBLISHED BY THE PROVIDENCE FRANKLIN SOCIETY IN MARCH, 1845. Proc. Prov. Franklin Soc. i. 1846, pp. 1–24. Annot. catalog. *phaenog.* and *cryptog.*

—— —— 1846. Proc. Prov. Franklin Soc. i. 18·7, pp. 25–42.

223. **Russell, Levi Ward.** THE NATIVE TREES OF RHODE ISLAND. Random Notes on Nat. Hist. ii. 1885, pp. 29–30, 36, 45, 55–56, 58–59, 69–70, 74, 83, 94; iii. 1886, pp. 6–7, 11–13, 20, 29, 36–37, 44, 53, 74–75, 82–83, 91–92. Select. spec., popular treatm. *phaenog.*

224. —— RARE TREES OF RHODE ISLAND. Gard. & For. ii. 1889, p. 34. Select. spec., popular treatm. *phaenog.*

Kent County: —

225. **Bailey, William Whitman.** WILD FLOWERS OF WARWICK. I–III. Random Notes on Nat. Hist. iii. 1886, pp. 60–61, 67–68, 75–76. Select. spec., popular treatm. *phaenog.*

Newport County: —

226. **Davis, Lucius D.** THE TREES AND PLANTS OF CONANICUT ISLAND. Proc. Newport Nat. Hist. Soc. 1888–89, pp. 32–42. Annot. catalog. *phaenog.* N. H.

Washington County: —

227. **Bailey, William Whitman.** LATE FLOWERS [OF EXETER, R. I.]. Bot. Gaz. iii. 1878, pp. 38–39. List. *phaenog.*

228. —— **and Collins, James Franklin.** A LIST OF PLANTS FOUND ON BLOCK ISLAND, R. I., IN JULY AND AUGUST. Bull. Torr. Club, xx. 1893, pp. 231–239. Annot. catalog. *phaenog.* and *vasc. cryptog.*

229. **Hollick, Arthur.** Notes on Block Island. Ann. N. Y. Acad. Sci. xi. 1898, pp. 55–88. Illus. Annot. catolog. *phaenog.*

Connecticut.

General works: —

230. A catalogue of the flowering plants and higher cryptogams growing without cultivation within thirty miles of Yale College. New Haven, 1878, pp. 71. Map. Annot. catalog. *phaenog.* and *cryptog.*

Published by the Berzelius Society and often called the Berzelius Catalogue.

231. **Bishop, James Nathaniel.** A catalogue of all the phaenogamous plants at present known to grow without cultivation in the State of Connecticut. Rep. Sec. Conn. Board Agric. 1885. Reprint, 1885, pp. 18. Annot. catalog. *phaenog.*

—— Same. Rep. Sec. Conn. Board Agric. 1895. Reprint, 1896, pp. 22. Annot. catalog. *phaenog.* and *vasc. cryptog.*

—— Same. Additions and corrections. Rep. Sec. Conn. Board Agric. 1897. Reprint, 1898, pp. 6.

232. **Eaton, Daniel Cady.** Plants new to the Connecticut flora [additional to the Berzelius Catalogue]. Bull. Torr. Club, x. 1883, p. 102. Suppl. list. *phaenog.*

233. **Johnson, Lorenzo Nickerson.** Notes on the flora of southwestern Connecticut. Bull. Torr. Club, xix. 1892, pp. 88–91. Select. spec., popular treatm. *phaenog.*

234. **Miller, Elihu Sanford.** A few additions to the Berzelius Catalogue. Bull. Torr. Club, x. 1883, pp. 120–121. Suppl. list. *phaenog.*

235. **Terry, William Almeron.** Diatoms of the Connecticut shore. i–viii. Am. Monthl. Micros. Jour. xiii. 1892, pp. 185–189, 230–232, 253–256; xiv. 1893, pp. 45–48, 140–143; xv. 1894, pp. 74–83; xvi. pp. 41–47, 269–276. Annot. catalog. *cryptog.* N. H.

Litchfield County: —

236. **Brace, John Pierce.** List of plants growing spontaneously in Litchfield and its vicinity. Am. Jour. Sci. iv. 1822, pp. 69–86, 292–309. Annot. catalog. *phaenog.* and *vasc. cryptog.*

237. **Underwood, Lucien Marcus.** The pteridophyta of Litchfield Co., Ct. Bull. Torr. Club, xi. 1884, pp. 7–8. Annot. catalog. *cryptog.*

New Haven County: —

238. **Davis, Charles Henry Stanley.** A list of the forest trees and shrubs to be found in Meriden, Conn. Trans. Meriden Sci. Assoc. iii. 1887–88, pp. 46–78. Annot. catalog. *phaenog.* N. H.

239. **Hall, Franklin Wilson.** A list of the lichens found growing within twenty miles of Yale College. Am. Nat. xi. 1877, pp. 170–175. Annot. catalog. *cryptog.*

240. —— List of the marine Algæ growing in Long Island Sound, within twenty miles of New Haven. Bull. Torr. Club, vi. 1876, pp. 109–112. Annot. catalog. *cryptog.*

241. **Ives, Eli; Tulley, William;** and **Leavenworth, Melines C.** Catalogue of the phenogamous plants, and of the ferns, found within five miles of Yale College. In Baldwin, E. Annals of Yale College in New Haven, Connecticut, 1831, App. pp. 264–302. List. *phaenog.* and *vasc. cryptog.* H. C.

242. **Kendrick, Ella Bagnell.** Additional plants found growing in Meriden, Conn., since issue of Catalogue in 1885. Trans. Meriden Sci. Assoc. ii. 1885–86, pp. 54–57. List. *phaenog.* and *vasc. cryptog.* N. H.

243. **Leonard, Emily Josephine.** Catalogue of the phaenogamous and vascular cryptogamous plants found growing in Meriden, Conn. (uncompleted). Published after the author's death in Trans. Meriden Sci. Assoc. i. 1884. Meriden, 1885, pp. 40. Annot. catalog. *phaenog.* and *vasc. cryptog.*

244. **Terry, William Almeron.** Notes on diatoms and other algæ of New Haven harbor and adjacent waters. Am. Monthl. Micros. Jour. ix. 1888, pp. 225–227. Select. spec., popular treatm. *cryptog.* N. H.

New London County: —

245. **Case, George Reynolds, and Setchel, William Albert.** A catalogue of wild plants growing in Norwich and vicinity, arranged in the order of flowering, for the year 1882. Norwich, 1883, pp. 12. Annot. catalog. *phaenog.*

PRELIMINARY LISTS OF NEW ENGLAND PLANTS IV.[1]

B. L. Robinson.

[The sign + indicates that an herbarium specimen has been seen; the sign — that a printed record has been found.]

Cistaceae.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Helianthemum canadense, Michx.	+	+	+	+	+	+
" majus, Britt., Sterns & Poggenb.	+	+	+	+	+	+
Hudsonia ericoides, L.	+			+	+	
" tomentosa, Nutt.	+	+	+	+	+	+
Lechea intermedia, Leggett	+	+	+	+	+	+
" juniperina, Bicknell	+	+				
" Leggettii, Britt. & Holl.				+		+
" major, Michx.	—		+	+	+	+
" maritima, Leggett	+	+		+	+	+
" minor, L.				+	+	
" racemulosa, Lam.				—		
" tenuifolia, Michx.				+	+	+

Elatinaceae.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Elatine americana, Arn.	+	+		+	+	+

Hypericaceae.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Ascyrum hypericoides, L.				+		
Hypericum adpressum, Bart.	—			+	+	
" Ascyron, L.		+	+	+		+
" boreale, Bicknell	+	+	+	+	+	+
" canadense, L.	+	+	+	+	+	+
" " var. majus, Gray	+	+	+	+	+	+
" ellipticum, Hook.	+	+	+	+	+	+
" maculatum, Walt.	+	+	+	+	+	+
" mutilum, L.	+	+	+	+	+	+
" nudicaule, Walt.	+	+	+	+	+	+
" perforatum, L.	+	+	+	+	+	+
" virginicum, L. (*Elodes campanulata*, Pursh)	+	+	+	+	+	+

[1] Printed in Rhodora as supplementary material.

ANACARDIACEAE.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Rhus canadensis, Marsh.			+			
" copallina, L.	+	+	+	+	+	+
" glabra, L.	+	+	+	+	+	+
" Toxicodendron, L.	+	+	+	+	+	+
" typhina, L.	+	+	+	+	+	+
" venenata, DC.	—	—	+	+	+	+

SAPINDACEAE.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Acer Negundo, L.	+	+	+	+	+	+
" pennsylvanicum, L.	+	+	+	+	+	+
" rubrum, L.	+	+	+	+	+	+
" saccharinum, L. (*A. dasycarpum*, Ehrh.)	+	+	+	+	+	+
" Saccharum, Marsh. (*A. saccharinum*, Wang.)	+	+	+	+	+	+
" " var. nigrum, Britt.	—		+			
" spicatum, L.	+	+	+	+	+	+
Staphylea trifolia, L.		—	+	+	+	+

POLYGALACEAE.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Polygala brevifolia, Nutt.					+	
" cruciata, L.	+			+	+	+
" Nuttallii, Torr. & Gray				+	+	+
" paucifolia, Willd.	+	+	+	+	+	+
" polygama, Walt.	+	+	+	+	+	+
" " var. abortiva, Chodat	+			+		
" sanguinea, L.	+	+	+	+	+	+
" Senega, L.	—		+		+	+
" verticillata, L.	+	+	+	+	+	+
" " var. ambigua, Wood.	+	+	+	+	+	+

NOTES UPON THE ABOVE LISTS.

Old and indefinite reports of plants, such as *Lechea minor*, which have been variously interpreted or subjected to recent division, are purposely omitted in the foregoing records.

The Vermont and northern New Hampshire reports of *Hudsonia ericoides*, L., in the Synoptical Flora, i. 191, Gray's Manual, etc., are erroneous and refer to *H. tomentosa*, Nutt.

The *Lechia minor*, var. *racemulosa* of Bennett's Catalogue of Rhode Island Plants, appears to rest upon wrongly-named material. The *Acer saccharinum*, var. *nigrum* of the same list is probably an error.

The *Lechea major* of Professor Jesup's Catalogue of Plants of Hanover, N. H., proves to be *L. intermedia*.

Rhus Cotinus, L., is reported by Dame & Collins, Fl. Middlesex Co., as "often found escaped" in Middlesex county, Massachusetts.

Aesculus Hippocastanum, L., the horse-chestnut, so commonly planted, has been reported in several local lists as "escaped," "self-sown," etc., but more exact data as to its persistence in a wild state are lacking. Similar reports could be made of *Acer Psuedo-platanus*, *A. platanoides*, and in fact many other plants of cultivation.

Cardiospermum Halicacabum, L., has been found by Mr. C. E. Perkins as a casual plant on waste ground at Somerville, Massachusetts.

A form of *Acer Saccharum*, Marsh., resembling at least in the contour of the leaves, the var. *barbatum* of Trelease, has been found in Maine and southern New Hampshire by Mr. M. L. Fernald, but its genetic affinity to the thickish-leaved plant of Tennessee and Arkansas is at best doubtful.

Polygala Nutallii, was reported by Mr. W. S. Harris [1] as a characteristic plant in the flora of Windham, N. H., but the species on further examination proved, according to Mr. Harris, to be *P. sanguinea*.

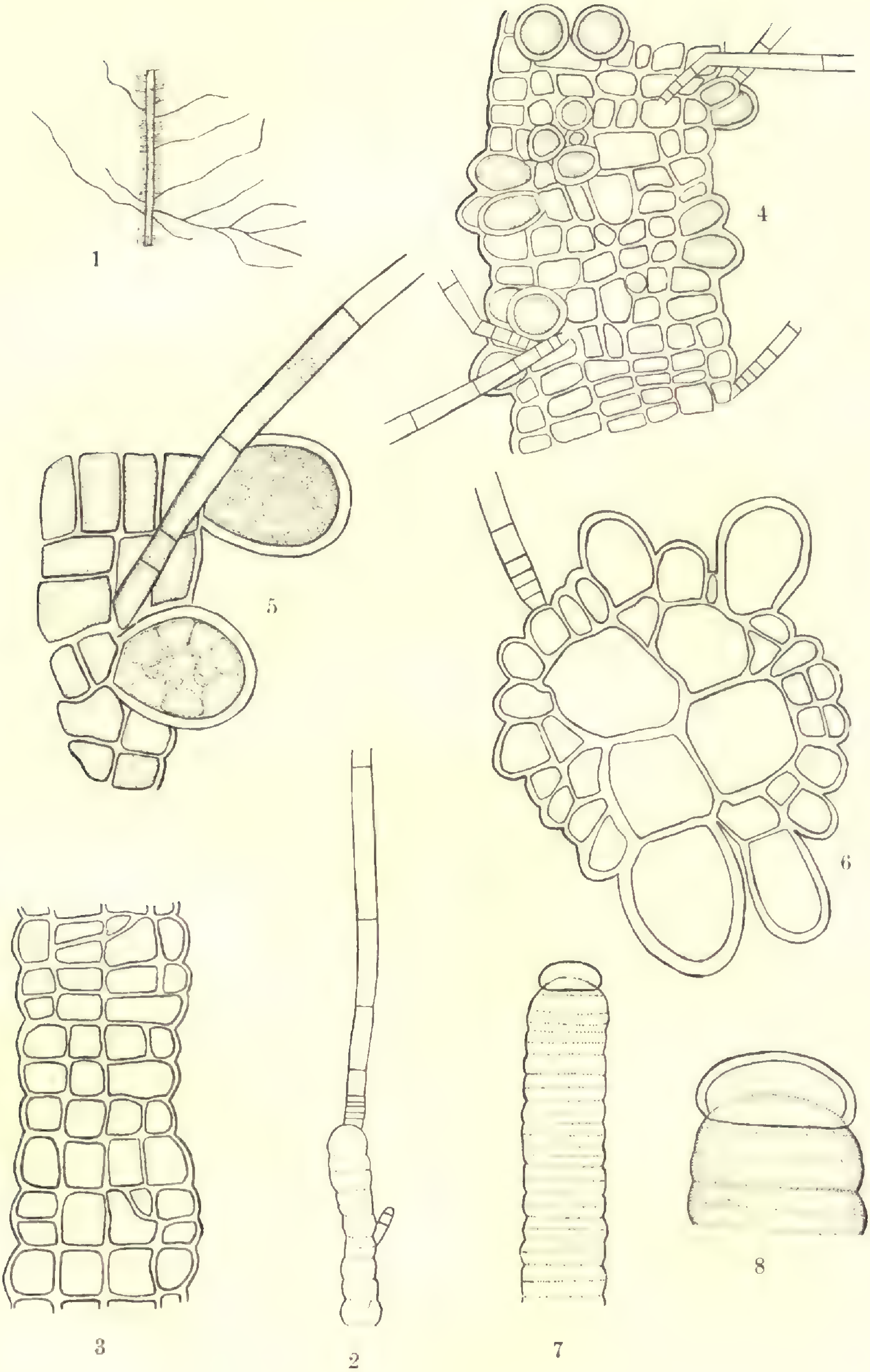
The record of *Polygala brevifolia*, Nutt., from Rhode Island rests upon a simple specimen collected long ago by Stephen T. Olney and now preserved in the herbarium of Brown University.

Polygala polygama, var. *abortiva*, Chodat (Monogr. Polygal. 280), is a variety or perhaps rather a state in which the upper as well as the basal racemes bear chiefly or exclusively cleistogamous flowers. This plant is worthy of field study and probably has a much wider distribution than is now known.

The desiderata of the above lists which may be sought with greatest confidence of success are *Hudsonia ericoides* in southeastern New Hampshire, *Elatine americana* in Vermont, and *Rhus canadensis* in northwestern Massachusetts.

[1] Flora of the town of Windham, 13.

Vol. I, No. 10, including pages 179 to 196, was issued October 2, 1899.



C. A. King del.

Fig. 1–6, Stictyosiphon subsimplex. Fig. 7–8, Hydrocoleum majus.

Oakes Ames del.

ADVENTITIOUS PLANTS OF DROSERA.

Rhodora

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WINTER BOTANIZING.

WM. P. RICH.

IN the early years of my botanical experience October brought to a close the collecting season, and with the appearance of the Witch-Hazel flowers I thought it useless to continue further exploration. As the Hepatica was to me, in those years at least, the first flower of the year, so the Witch-Hazel was the last. These two species marked the beginning and the end of my botanical calendar. For eleven years my note-books show no date later than October 22, but as the seasons came and went subjects of alluring interest presented themselves, gradually extending the botanical year at both ends, so that now to quote a sentence from Thoreau, "You cannot say that vegetation absolutely ceases at any season in this latitude."

The late E. H. Hitchings of interesting memory has recorded the fact that "the wild flowers even in this cold region, blossom every month in the year,"[1] adding in proof of his statement that he had found the Hepatica in flower from September to May, nine consecutive months. Somewhat surprised as well as interested by these statements, and with a desire to know for myself the extent to which our plants are found in flower during the winter months, I have during the past few years noted all such as I have seen or that have come to my notice through other observers. It is not of course intended in this article to include cryptogamous plants, such as mosses, lichens, fungi and algae, many of which, indeed, attain their fullest development more abundantly in the winter than in the summer months.

That wild-flowers bloom all the year round in New England, though literally true, is a statement obviously to be taken with many qualifica-

[1] Transactions Mass. Hort. Society, 1893.

tions, and it may be remarked that the smallest botanical box will be sufficiently large to hold all that may be found during the months of January and February. The two months just mentioned are, however, the only ones in which flowering plants will be found at all scarce.

Beginning with November let us briefly review the floral conditions existing in eastern Massachusetts during the colder months of the year. In this month plants in flower are so numerous as hardly to excite comment. On a recent excursion, November 13, fifty-one species still in flower were recorded, and the list might easily have been enlarged by further search.

In December during the earlier part of the month, should the ground be free from snow and the weather mild, as is frequently the case in this region, numerous plants still lingering in flower can usually be found without much effort. In that delightful sketch, "December out of Doors," by Bradford Torrey, occurs the fullest list of December flowers that I have yet seen. He records the names of sixteen species, and to that number I have thus far been able to add but three others, as follows: Hepatica (*Hepatica triloba*, Chaix), recorded by E. H. Hitchings; Common Dandelion (*Taraxacum officinale*, Weber); Seaside Golden Rod (*Solidago sempervirens*, L.). The Golden Rod I found as late as December 22, at Revere Beach, Mass., in fine fresh flower, though with blackened and shrivelled leaves.

The record for the next two months, January and February, though meagre, does not lack its representatives. In January there have been found in flower the Hepatica, E. H. Hitchings; Knawel (*Scleranthus annuus*, L.); Groundsel (*Senecio vulgaris*, L.), Bradford Torrey; Chickweed (*Stellaria media*, Cyrill.); and the Dandelion. On the 18th of this month in 1899 the Dandelion appeared in full bloom on a grassy bank at Chelsea, Mass., in such numbers as to attract public attention.

In February my list records the Hepatica, E. H. Hitchings; Chickweed, concerning which Thoreau remarks "apparently it never rests"; Skunk Cabbage (*Symplocarpus foetidus*, Salisb.), Frank Bolles; Dandelion; Mayflower (*Epigaea repens*, L.), a small bunch of which I received from Orleans, Mass., that was collected in full flower February 12, 1899, and on the same day my informant adds that some Strawberry plants in his garden were in bloom. The Dandelion, it may be said, has been found in flower every month of the year. Willows in staminate flower are occasionally met with in January and February, but owing to the difficulty of identifying the species they are not included in the lists.

I have confidence that the scant record for these two months can be increased as future opportunities offer for more extended observations, and doubtless some of the readers of RHODORA may be able to add to the number.

March, though sometimes in New England one of the severest of the winter months, offers so many plants in flower, especially toward the latter part, that a list of them would not be of especial interest.

There is other and more important work, however, in winter botanizing, than the mere enumeration of such chance flowers as a mild season may offer as a reward for the botanist's constant attention. Many fruits of trees and shrubs can now be collected and studied with better advantage than was possible earlier in the season. A hitherto much neglected subject for study is that of the winter state of our trees and shrubs, one to which increasing attention is now being given. It is surprising how few of them can be readily recognized by even the most competent botanist, and the collection and study of specimens of bark, twigs, and buds in their winter state will be found full of interest. The complete herbarium must show specimens of these in addition to leaves and flowers.

Another subject for study in winter botanizing is the observation of the radical leaves and basal shoots of herbs, some of which differ so much at this stage from those which we are accustomed to associate with the plant as to be very puzzling, and furnish material for collecting on many a winter walk.

While engaged in his occasional winter outings, in these and other kindred occupations, the botanist will soon have his attention attracted to other objects of most fascinating interest. On the lowlands, as he passes along on a sunshiny day in late February and March he will suddenly see, in the gleaming olive of a row of Willow shrubs and in the brilliant red of the Blueberry bushes, on a rocky hillside, signs that will remind him of the approach of another season, and as he stands upon the threshold of a new springtime, before he becomes engulfed in its rising tide of life, he would linger yet a little longer in the enjoyment of the winter's offerings.

BOSTON.

FERNS OF MARANACOOK, MAINE.

George E. Davenport.

During a brief vacation at Lake Maranacook I made out the following list of ferns which I saw growing in that vicinity.

Adiantum pedatum, L. One locality only, near the border of an old woodland stream among stones; plants not plentiful, and of medium size; no unusual forms seen.

Aspidium acrostichoides, Swz. Frequent, nearly always in deep shade and with margins variously serrated; some specimens approaching the incised form.

Aspidium Boottii, Tuckerman. Scarce, only one clump seen, but that one characteristic. No *Aspidium* seems to puzzle collectors more than this, yet it may nearly always be distinguished from *A. cristatum* by its glandular indusia. These are more or less persistent, and it is seldom that one, even when much contracted, cannot be found showing traces of glands.

Aspidium cristatum, Swz. Scarce, only a few plants seen, one approaching var. *Clintonianum*, and especially interesting, as it was like forms which I have had under cultivation since 1893, that are intermediate between typical *A. cristatum* and var. *Clintonianum*. On some of the pinnae of this plant, as on my own specimens, part of the indusia were convex and part plane or concave.

Aspidium marginale, Swz. Seen in one locality only.

Aspidium Noveboracense, Swz. Plentiful.

Aspidium Thelypteris, Swz. Also plentiful. At Monmouth fish hatcheries a few peculiar dark green sterile fronds, in shade, resembling *A. molle* were observed.

Aspidium spinulosum, Swz. Frequent, including forms *dilatatum* and *intermedium*.

Asplenium Filix-foemina, Bernh. Everywhere, in many forms.

Botrychium lanceolatum, Angs. and *B. matricariaefolium*, R. Br. Both scarce (only four specimens found), in vegetable mold of deep woods, with the next two.

Botrychium ternatum, Swz. Only a single specimen found, but that like some of Mrs. Barnes' plants from North Woods, N. Y., and near typical *B. ternatum*, although I know that Professor Underwood would not now accept it as such; but then I do not accept his treatment of this species.

Botrychium Virginianum, Swz. Frequent in deep damp woods; in all stages of development, clearly showing that the so-called var. *gracile* is merely a young state of the plant.

Dicksonia pilosiuscula, Willd. Everywhere abundant. In view of a recent effort to reëstablish *Dennstaedtia*, it may be well to state that Moore and Fournier are the only authorities of note to accept Bernhardi's genus, it having been rejected by the most eminent pteridologists from Swartz to Eaton.

Onoclea sensibilis, L. Common everywhere. I examined large patches of this in mown fields, on hillsides, and other places where it had been mutilated, but found no var. *obtusilobata*, although dwarfed and depauperate plants were present in great abundance.

Onoclea Struthiopteris, Hoffm. In several places, some plants magnificent but fertile fronds very scarce. It would be interesting to know just why this species fruits so sparingly even under conditions that are apparently favorable to its full development. Possibly its habit of increasing so rapidly by subterranean runners may have something to do with this.

Ophioglossum vulgatum, L. Large forms in woodland on the border of the lake; also plentiful on a hillside.

Osmunda cinnamomea, L. and *O. Claytoniana*, L. Both abundant and luxuriant.

Osmunda regalis, L. Less abundant, the plants smaller in proportion and mostly sterile; even where fertile not over two feet tall, thus strangely dwarfed for this grand species.

Phegopteris Dryopteris, Fée. Plentiful in the shade of deep woods, about old tree-trunks and often in moss with *Tiarella cordifolia*.

Phegopteris hexagonoptera, Fée. Less frequent, seen in one place only.

Phegopteris polypodioides, Fée. Frequent, in great masses by itself or mixed with other ferns in mossy clumps, in deep old woods; less abundant in exposed situations.

Pteris aquilina, L. Common everywhere.

All the ferns here recorded grow within half a mile of Maranacook Hotel, but I made many long excursions in a vain effort to find *Aspidium Goldieanum*, which it seemed to me ought to grow somewhere in that vicinity. The absence of rocky ravines and ledges apparently accounted for my not finding any *Polypodium* or the smaller Aspleniums or Woodsias; but there are plenty of situations where *Cystopteris* should be found.

The country surrounding Lake Maranacook is exceedingly beautiful in its scenic character, and intensely interesting botanically. The woodlands are rich with the accumulation of vegetable mold in which the ferns and other plants luxuriate. On the Winthrop side there are some very dense cedar swamps which I did not get time to explore. The altitude of the lake itself is five hundred feet above sea level, and that of the surrounding country of course still greater.

PLANTS FROM THE EASTERN SLOPE OF MT. EQUINOX.

Mary A. Day.

In the year 1898 my sister and I spent a large part of the summer in Manchester, Vermont. This place is situated in the southwestern part of the state, at the base of Mt. Equinox, and is surrounded by mountains of the Equinox and Green Mountain ranges. The soil is sandy, with limestone and marble ledges on the mountains. We were located on the eastern slope of Mt. Equinox, at an elevation of about twelve hundred feet, while the mountain itself rose to nearly four thousand feet. In the vicinity we made a collection of plants, of which some had not before been recorded from Vermont, and others, although reported from a few stations, appear to be rare and local in the state. The collection numbered about thirty-two hundred specimens, which were determined at the Gray Herbarium, and distributed in sets to the leading herbaria of this country. The forms marked with an asterisk are not reported from Vermont in Perkins' latest catalogue.

Among the rarer plants by roadside and in open fields near the highway we found **Brassica juncea*, Cosson, *Erysimum cheiranthoides*, L., *Geum strictum*, Ait., **Prunus avium*, L., **Agrimonia Brittoniana*, Bicknell, **A. hirsuta*, Bicknell, **Galium palustre*, L., *Aster ericoides*, var. *Pringlei*, Gray, *A. tardiflorus*, L., *Prenanthes alba*, L., **Solidago canadensis*, var. *procera*, Gray, *Solidago patula*, Muhl., **Lophanthus scrophulariaefolius*, var. *mollis*, Fernald,[1] *Phryma leptostachya*, L., **Polygonum*

[1] Lophanthus scrophulariaefolius, Benth., var. **mollis**, Fernald, n. var. "Stems densely soft-tomentose; leaves pale beneath with dense short tomentulose hairs, less pubescent above. — Dry thicket, Dorset, Vermont, July 20, 1898, *Mary A. Day*, no. 332; Cincinnati, Ohio, 1839, *J. G. Lea;* Marion County, Illinois, *M. S. Bebb;* Illinois, without definite station, *S. B. Mead.* — In its pale color and dense pubescence very different from the greener, sparingly pubescent *L. scrophulariaefolius*, and, when compared with the extreme form of that plant, appearing specifically distinct. Many specimens, however, show such intermediate characters that the two plants can be treated only as varieties of one species."

ramosissimum, Michx., *Rumex patientia*, L., *Platanus occidentalis*, L., **Allium fistulosum*, L., *Typha angustifolia*, L., **Carex tribuloides*, var. *Bebbii*, Bailey, *C. eburnea*, Boott, and *C. Schweinitzii*, Dewey. Growing on plantain and clover we found the recently introduced **Cuscuta Epithymum*, Murr., and **Convolvulus japonica*, Thunb., had established itself near an old flower-garden. **Physalis heterophylla*, Nees, with its variety **ambigua*, Rydberg, grew in open fields. The "poison hemlock," *Conium maculatum*, L., was found in several places, but always within a short distance of dwellings. *Euphorbia Helioscopia*, L., had established itself as a weed, and *Chenopodium capitatum*, Wats., reproduced itself year after year in a garden where a plant had been transplanted from the mountain. In dry soil, near a small lake, were *Asclepias tuberosa*, L., and *Gentiana quinqueflora*, L. *Equisetum variegatum*, Schl., grew quite abundantly by a brook near the village. On the lower slope of the mountain was a large, open pasture, having dry, poor soil, but furnishing some interesting plants. Here *Anemone cylindrica*, Gray, and **Hypericum boreale*, Bicknell (usually of moister habitat), were found, also *Aster ptarmicoides*, Torr. & Gray, **Blephilia ciliata*, Raf., **B. hirsuta*, var. *glabrata*, Fernald,[1] *Calamintha Clinopodium*, Benth., and *Monarda fistulosa*, var. *mollis*, Benth.

As we ascended the mountain where the forests commenced, the soil changed from sandy to rich dark earth, and there was a marked difference in the growth of the plants. *Ribes oxycanthoides*, L., and **R. rubrum*, var. *subglandulosum*, Maxim., were found growing side by side. **Circaea intermedia*, Ehrh., reported from Maine (RHODORA, i. 102) but not elsewhere from North America, grew here with *C. alpina* and *C. Lutetiana*, L. *Uvularia grandiflora*, Smith, was found sparingly in open places, and *Cystopteris bulbifera*, Bernh., grew abundantly in one locality. An open knoll was covered with *Juniperus Sabina*, var. *procumbens*, Pursh., which formerly had been only doubtfully reported from the state. This was found in two other dry places in great abundance. *Microstylis monophyllos*, Lindl., was also found in these woods. At a higher elevation, near Table Rock, a place of about two thousand

[1] BLEPHILIA HIRSUTA, Benth., var. **glabrata,** Fernald, n. var. "Stems glabrous or minutely puberulent, villous only at the very tips, or with a few scattered long hairs on the angles below; leaves glabrous or very slightly pubescent; head solitary, terminal, or with one or two approximate (not remote) lower ones. — Dry wooded slope of Mt. Equinox, Manchester, Vermont, July 1, 1898, and in dry open pastures, base of Mt. Equinox, July 5, 1898, *Mary A. Day*, nos. 140, 141."

feet altitude, were found *Clematis verticillaris*, DC., *Arabis hirsuta*, Scop., **Arabis lyrata*, L., **Rosa acicularis*, Lindl., *Lonicera dioica*, L., *Galium lanceolatum*, Torr., **Rhododendron canescens*, G. Don, *Hydrophyllum virginicum*, L., *Habenaria Hookeriana*, Torr., *Carex scirpoidea*, Michx., and *Asplenium Ruta-muraria*, L. Higher up on the mountain was *Allium tricoccum*, Ait. In the lower lands we found **Sanicula trifoliata*, Bicknell, *Aspidium Goldianum*, Hook., and in very wet ground, beside a brook, *Myosotis palustris*, With., and *Gratiola virginiana*, L., while in a marsh was *Scheuchzeria palustris*, L. The grass of Parnassus, *Parnassia caroliniana*, Michx., grew everywhere in the lower damp regions in great abundance.

Gray Herbarium.

HONEY-GUIDES OF NIGHT BLOOMERS.

E. Williams Hervey.

A recent writer comparing the colors of a diurnal bloomer having honey-guides, with a white-flowered nocturnal bloomer having no honey-guides, remarks that the latter "has no lines to indicate the whereabouts of its nectar, for these would be undistinguishable in the dark and therefore useless," implying that nocturnal flowers never have honey-guides. In my recently published Observations on the Colors of Flowers, I took exception to this statement and cited *Convolvulus sepium* as an example of a flower blooming in the morning twilight. To this example should be added *Datura Tatula*, and *Ipomœa purpurea*, the Morning Glory. The former is of a lavender color outside, and with only a slight tinge of blue within, appearing nearly white. Midway between the top and bottom of the tube, there are fifteen deep-purple, longitudinal lines of about an inch in length, viz., three to each of the five ribs. The flower in August expands between five and six o'clock p.m. and closes early the next morning.

Ipomœa purpurea has white, pink, purple and blue varieties; each variety has five stripes or rays running from the border of the limb to the commencement of the tube; the rays are always of a color, or at least of a shade, different from the flower, a white flower usually having pink, and a blue one red-purple rays, etc. A white variety is occasionally seen without any colored markings.

All these different varieties of the flower opened at the same time,

viz., at about half past three o'clock A.M. in the month of August, or fully an hour before sunrise, and while it was so dark that the aid of a lantern was necessary to distinguish the violet and purple blossoms. On bright days these flowers begin to droop at 9 A.M. and are permanently closed by noon.

There are other colored night bloomers besides the lavender-purple *Datura*. For example, *Lychnis dioica*, a pink flower, expands its petals between 6 P.M. and midnight.

NEW BEDFORD.

FURTHER ADDITIONS TO THE FLORA OF MIDDLESEX COUNTY, MASS.

ALFRED W. HOSMER.

IN collecting plants in Concord, Mass., and neighboring towns for the past ten years, I have found the following which are not given in Dame & Collins' Flora of Middlesex County, or if mentioned are spoken of as rare. In the latter case I add a new station.

Anemone Pennsylvanica, L. Dry open roadside in the northern part of Concord.

Cardamine pratensis, L. Quite abundant in wet meadows in Weston.

Viola canina, var. *Muhlenbergii*, Gray. White-flowered form, found in Concord and Acton, persistent for many years.

Malva sylvestris, L. Dry open roadsides, Concord and Acton.

Erodium moschatum, Willd. Very abundant in an asparagus field, Concord, where only commercial fertilizers had been used.

Polygala paucifolia, Willd. Violet-flowered form, found in Sudbury in 1893, spreading.

Lathyrus pratensis, L. Found in a cultivated field, Concord in 1891.

Spiraea tomentosa, L. White-flowered form, found in Carlisle.

Rubus Canadensis, L. Double-flowered form, beside a railway track, Concord, 1893, spreading.

Rosa canina, L. Persistent in Concord at three stations for some twenty-five years.

Echinacea purpurea, Moench. Persistent at Acton for seven years.

Cnicus horridulus, Pursh. Concord at two stations and spreading.

Erythraea Centaurium, Pers. Found at Concord in 1890, not seen since.

Sabbatia gracilis, Salisb. One station in Concord, found in 1897.

Phlox subulata, L. Sandy roadsides, Acton.

Physalis Virginiana, Mill. Field in Sudbury.

Utricularia resupinata, B. D. Greene. Ponds in Concord, Acton and Lincoln.

Utricularia gibba, L. Fairhaven Bay, Concord.

Amarantus hypochondriacus, L. Persistent for four years on a dump at Concord.

Sagittaria natans var. *gracillima*, Watson. Concord river.

Sagittaria teres, Watson. Sandy pond, Lincoln.

Concord, Mass.

LEPIOTA RHACODES.

H. Webster.

(Plate 11.)

For several years *Lepiota rhacodes* Vitt., has been conspicuous at the autumn exhibitions of the Boston Mycological Club. Although it has been reported from various parts of the country, it seems nowhere to be so well known, or at any rate so familiar as an edible mushroom, as it is in the neighborhood of Boston, where it annually fruits in generous abundance in numerous places. In size and general appearance it resembles the common Parasol Mushroom (*Lepiota procera* Scop.), to which it is so closely related that Berkeley[1] speaks of intermediate forms, difficult to refer to either species, and Massee[2] reduces it to a variety. To Vittadini, however, the two species seemed absolutely distinct, and his conclusion will seem amply justified to any one who will compare fresh material in all stages with his careful drawings and minutely accurate descriptions.[3] For the benefit of New Englanders and others who cannot do this, and who yet may like to try the edible qualities of this fungus, if they find it, a few notes from fresh specimens are here offered.

The young buttons, from the size of a pea to that of a hazelnut, are globose and white, and hold the developing cap entirely enclosed

1 Outlines of British Fungology, 92, Pl. 3, f. 6. 2 British Fungus Flora III; 234.

3 Funghi Mangerecci 158–162, Pl. XX, and 182–188, Pl. XXIV.

by the universal veil, much as in Amanita. As they increase in size they gradually take the form of a thick, fleshy, saucer-shaped cup, in which the cap first manifests itself as an umbonate swelling, from which the external covering soon tears away, leaving the smooth, brown, globose pileus exposed. In this stage, which is reached by the time that the fructification is above ground, the resemblance to an acorn in a thick white cup is striking.[1] Round the stem is a marked channel or depression, but as development progresses this gradually disappears. For some time, however, the base retains a broad rim, but with the full upward expansion of the stem this rim is reduced and may disappear. For a long time the cap remains globose, swelling to great size before the veil, which is continuous, separates from the margin. During this process the smooth inelastic outer skin of the cap is stretched to the breaking point, and numerous horizontal and vertical cracks appear, especially near the margin. When the cap is fully expanded only the disk or central portion retains a smooth unbroken surface. Everywhere else are large brown scales, with the fibrous, whitish flesh showing between. The veil tears away raggedly from the edge of the cap, and retains for some time its horizontal position, standing out as a stiff collar sometimes nearly an inch wide. Gradually it shrinks, separating at the circumference into two more or less well-defined layers, which curl away from each other slightly, with fibrous edges. Eventually, as in *L. procera*, the ring becomes moveable. The fully expanded cap is usually slightly depressed at the disk. The broad gills are attached at their inner ends, as in *L. procera*, to a conspicuous "collarium," which forms a socket that receives the apex of the stem.

Although much like *L. procera* in many ways, *L. rhacodes* differs in being shorter, broader, fleshier and heavier, and in being bigger in all corresponding parts. Even in the button stage *L. procera* shows a tendency to lengthen out, the stem apparently leading in the process of expansion. In consequence the globose young condition is soon changed for an ellipsoid form, the end of the stem, above which the flesh is comparatively thin, pushing up into an umbo which remains a characteristic feature of the expanded pileus. Moreover the pileus is not so extremely ragged as in *L. rhacodes*, and the ring is comparatively much smaller, as is the bulbous base of the stem. In *L. procera* the stem is

[1] See Plate 11. Good illustrations of the fully developed fruit are given by Cooke (Illustrations), Gillet (Hymenomycetes), and Richon et Roze (Atlas), as well as by Berkeley and Vittadini.

of the same general color as the cap, and more or less roughened by the breaking up of the outer surface. In *L. rhacodes* the stem is white and somewhat pruinose. Moreover it stains brown on being handled, a point not noted by Vittadini. On exposure to the air the flesh of *L. rhacodes* assumes a brownish orange tint. The cross-cut stem is even a dark red-brown. The same colors are seen in the expressed juice. A similar change of color to some shade of red has been noted in some forms of *L. procera*.

In spore characters the two species are markedly different, although in both there is a considerable variation in the size and shape of the spores. Recent examination of both dried and fresh material gives the following data: —

L. procera: spores oblong-ellipsoid to ovoid-ellipsoid, always with an even outline, sometimes round-pointed at the smaller end; contents granular; size $12\frac{1}{2}$ to $18+$ by $9\frac{1}{2}$ to $12\frac{1}{2}$ μ.

L. rhacodes: spores irregularly ovoid or ovoid-ellipsoid, blunt or frequently truncate and angular at the smaller end, 1 to 4 guttulate; markedly smaller than those of *L. procera*, being $9\frac{1}{2}$ to $14+$ by $6\frac{1}{4}$ to $9\frac{1}{2}$ μ.

In habit and in habitat the two species are again different. *L. procera* is frequently solitary, grows in fields and woods, and is apparently native. Its distribution is wide. *L. rhacodes* is usually caespitose, the bases of the stems being united in a thick white mass, sometimes as much as a foot across and over an inch thick, which lies almost entirely above ground. From such a mass, however, the individuals can be easily torn apart.

As found about Boston *L. rhacodes* has the appearance of an introduced plant. It occurs in or near greenhouses or in enriched soil out of doors. Some years ago in a greenhouse in Lynn the luxuriance of its fruiting proved a nuisance to the florist who, unaware of its edibility, was at some trouble to keep his house clear of it, finding necessary the use of a rake and a bushel basket. In Cambridge it likewise grows in a greenhouse under the benches, where it appears in force towards the end of September, and occasionally also at various times during the winter. At Allston it is found on very rich soil where sweepings from cattle cars used to be thrown. Here the clusters are very dense, the pilei overlapping. The color in this out-of-door station is very much darker than in the other places mentioned, and in the greenhouses it is darker where the sun falls upon it. It has been found in greatest luxu-

riance in Peabody by Mr. R. B. Mackintosh. In that town it grows in and about the old tanneries, but particularly in certain rather open cellars the floor of which is a surface of exhausted tanbark which forms a rich soil to the depth of several feet. In this situation the development of the fungus is truly astonishing. In one cellar under an old skating-rink it possesses the ground in its fruiting season. For weeks in September and October groups, almost groves of it eight or ten inches high, with pilei seven to nine inches broad, come up all over the ground, particularly about the bases of the cedar posts which support the floor above. A scratch in the soil anywhere shows mycelial strands extending horizontally at a depth of an inch or two. Some specimens collected here had bases as big as a door-knob with the hollow in the interior of the stem almost big enough to admit a lead pencil.

From this preserve the owner sold last year a number of pounds of the buttons to marketmen, but the experiment of introducing the fungus upon the market resulted unsuccessfully, the mushroom-buying public being conservative in taste, and also cautiously adherent to tradition. Notwithstanding this, and also in spite of Vittadini's condemnation of this *Lepiota* as unsuitable for the table, it can be said to be an excellent mushroom when properly cooked. Had Vittadini caused it to be placed with his favorite condiments in a closed dish, containing sufficient water to prevent drying, and had he then kept it in a hot oven for an hour, he would probably have had some more enthusiastic remark to make than that "having experimented upon it several times, even in considerable doses, he had suffered no inconvenience from it." He might have been inclined with some Boston mycophagists to rank *Lepiota rhacodes* with *Agaricus campestris* and *Coprinus comatus*.

Explanation of Plate 11. A natural cluster of about twenty undeveloped fruits of *Lepiota rhacodes* Vitt., found at Allston, Mass., in October, 1899, by Mr. G. B. Fessenden, who kindly furnishes the photograph. All of the buttons have advanced beyond the stage in which the pileus is covered by the enveloping membrane, traces of which may, however, still be discerned in the thin, ragged rim of the cup.

RANUNCULUS ACRIS, VAR. STEVENI, IN NEW ENGLAND.

M. L. Fernald.

In the extensive collection of New England plants recently presented to the Gray Herbarium by Mr. Charles E. Faxon, was found a single sheet marked by its alert collector, the late Edwin Faxon, "*Ranunculus*

acris?" The inclosed specimen, differing from true *Ranunculus acris* in having very broad leaf segments instead of many linear segments, was collected at Franklin Park, Massachusetts, in late August, 1887. Comparison with the original descriptions, as well as specimens and figures, showed it to be the European *R. Steveni* of Andrzejowski. The attention of members of the New England Botanical Club was called to the plant, and during the past summer observations have been made by them and by botanical correspondents who have generously supplied the writer with specimens and notes from various sections of New England. Among others from whom much assistance has been received grateful mention is made of Miss M. P. Cook, who has furnished notes and specimens from several stations in eastern Massachusetts, Mr. C. H. Knowlton, who has supplied material from Franklin Co., Maine, Miss E. L. Shaw, who has collected forms of the plant in eastern Massachusetts and on Mt. Desert Island, and Mrs. E. H. Terry, who collected at Jefferson, New Hampshire, a most interesting series of foliage variations, and who has since supplied notes from Northampton, Massachusetts.

From the observations of these and other correspondents, and personal studies of the writer and others in Maine and New Hampshire, the conclusion is drawn that the real *Ranunculus acris*, with the leaf-divisions cut into many linear segments, is, at least in the northern part of New England, much less common than the broad-leaved plant generally known in Europe as *R. Steveni*. During the recent session of the Alstead School of Natural History the plant was carefully watched in western Cheshire County, New Hampshire. On the high plateau about Alstead Centre the broad-leaved plant is abundant, but the finely cut foliage of true *R. acris* is rarely seen. In the region of Walpole, however, the latter plant appeared to be as abundant as *R. Steveni*. Though in the region of Alstead and in sections of Maine where the buttercups have been watched the two forms are usually strongly marked, and, as at Alstead Centre, one of them abounds to the practical exclusion of the other, it is no exception to find individuals bearing both coarsely and finely cut foliage. Other distinctions between the two plants have been searched for in vain. The foliage of *R. Steveni* appears in the field much thicker and heavier than that of *R. acris*, but this is apparently due to the narrow leaf-divisions of the latter plant. The flowers and fruit appear identical in the two forms. With no other difference than this purely habital one, the breadth of the leaf-segments, the plants, although generally very marked as to this point, can hardly be maintained as distinct

species. In Europe the broad-leaved form has generally been treated as a species or at least a subspecies of *R. acris* under Andrzejowski's name *R. Steveni* or the earlier name *R. sylvaticus*, Thuill. It is so treated by Reichenbach, who gives excellent plates of this and of true *R. acris* (Reichb. Ic. iii. t. 16 bis., 17).

By some recent authors, as Lange and Blytt, *R. Steveni* is treated as a variety of *R. acris* (var. *Steveni*, Lange, Haandbog Danske Fl., 380), and this disposition of the plant seems from its behavior in America to be the just one.

As already stated, in northern New England, *Ranunculus acris*, var. *Steveni*, Lange, is generally more abundant than the true *R. acris*. It has not been seen, however, from South of Hull, Massachusetts (*Miss M. P. Cook*), and Northampton (*Mrs. E. H. Terry*), but, as it is the predominant form at these places, it may be expected to extend over a broader range than we yet know. The true *R. acris* with many linear leaf-segments has been examined from Maine, New Hampshire, and Massachusetts, while from Rhode Island and Connecticut that form alone has been seen.

It is suggested that, as both forms of leaves are sometimes found on a single plant, the broad-leaved var. *Steveni* may be a seasonal state of the narrow-leaved *R. acris*. That this is not the case, however, seems probable from the fact that in late summer, when the foliage of var. *Steveni* was conspicuous in the fields, well developed plants of the true *R. acris* were also found; and, furthermore, if these two forms were seasonal developments of one plant, it seems improbable that they should have been so long distinguished abroad by such men as Thuillier, Andrzejowski, Reichenbach, Lange, Blytt, Hartman, Nyman, and many others.

Gray Herbarium.

Three plants of Berkshire County, Massachusetts. — For several years I have noticed in a peat bog, in Stockbridge, Mass., a handsome willow, growing as a shrub fifteen feet or less in height. The persistence, or late ripening of the fruit is particularly characteristic; a branch collected September 24, still retains its half opened capsules. The willow grows plentifully in beds of sphagnum, in company with *Betula pumila* L. and *Sarracenia purpurea* L. Mr. C. E. Faxon, who has kindly examined a branch, pronounces it *Salix amyg-*

daloides Anders. As the most eastern station for this willow so far reported is Central New York, this record is the first for New England.

A grass collected by me in Sheffield, Berkshire County, has been identified through the kindness of Mr. W. Deane, as *Eragrostis Frankii* Steud., hitherto recorded no farther north than northern New Jersey. I have unfortunately no data by which to determine whether the grass is native in Sheffield.

Scabiosa australis Wulf., naturalized from Europe, has been known to the botanists of Pittsfield since 1892. It grows sparingly in several wet, grassy spots and abundantly in at least one. The effect of the loose habit and pale blue heads is rather pretty, in spite of its weedy look in the dried state. — Ralph Hoffmann.

ERRATA.

Page 20, line 10; *for* Calystoma *read* Calostoma.
" 47, " 32; " Serringe " Seringe.
" 53, " 14; " *repanda* " *repandum*.
" 117, " 2; " **Furbush** " **Furbish**.
" 134, " 31; " New Hampshire, Peterboro, *read* Massachusetts, Petersham. The same error occurs on page 131, line 33.

Page 135, line 2; *for* 4 cm. *read* 4 mm.
" 158, " 9; " **Orchids of Massachusetts** *read* **Stone, George Edward.** Orchids of Massachusetts.

Page 166, line 11; *for* "canoe" *read* "cánoe."
" 170, " 36; " *Pogonatum* " *Polygonatum*.
" 183, " 21; " *matricaria* " *matricariae*.
" 185, " 3; " *Zygadenos* " *Zygadenus*.
" 200, " 13; " *dilata*, " *dilatata*.
" 201, " 21; " Lake Quacumquasit *read* Lake shores, Brookfield, September 4. Abundant along gravelly east shore of Quaboag Lake, and a few specimens on Lake Quacumquasit.

Page 204, line 20; *after* once *insert* May 21.
" 214, " 1; *for Lechia read Lechea*.
" 214, " 21; " *Nutallii* " *Nuttallii*.
" 214, " 25; " simple " single.

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Photographed from life.

BUTTON STAGES OF LEPIOTA RHACODES VITT.

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